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"The purpose of this study was to analyze and correlate television research in the teaching-learning process by means of a classification system, (1) to organize the information so that it would be readily and meaningfully available, (2) to identify what is now known, and (3) to determine what is not known and suggest directions for future research." Itemizes 53 conclusions resulting from the undertaking and discusses possible directions for future research.

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TELEVISION RESEARCH IN THE TEACHING-LEARNING PROCESS

by

Presley D. Holmes, Jr., Ph.D.

Research Associate

Wayne State University

U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
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By

Presley D. Holmes, Jr.

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CHAPTER I

INTRODUCTION

"The 1950s already have earned the title of the 'Era of Educational Debate.' We have talked, scolded, and analyzed the school more continuously during this decade than we have any other institution."[1]

Demographic data indicate an ever increasing number of individuals who will be seeking an education.

Other statistics highlight the fact that the supply of teachers is falling short of the demand for them.

Political and scientific events, such as the launching of the Sputnik by the Russians, increase the tempo of the debate.

These are but a few of the many issues to be considered. From these issues grow problems and innumerable proposals for solutions, all of which are honestly aimed at finding ways to improve the effectiveness and efficiency of the teaching-learning process.

Considerable research has been conducted by educators and educational institutions to determine how to teach, how a man learns, and what means and methods are effective to enhance learning.

One area that has been of interest to educators, and certainly one of the issues in the debate, is the utilization of television in the teaching-learning process. There is a growing amount of data, resulting from research and experimentation with television, which can be used as a basis for making decisions about the future course of education.

---

[1] "Design for Learning," Saturday Review, Feb. 14, 1959, Vol. XLII, No. 7, p. 17.

This was aptly summed up by Charles Hoban in a paper presented at the United States Office of Education Conference on Research in New Media.

> ...it is necessary to recognize that educational research and educational change are structurally related. It is inconceivable that educational research should have any major function other than to provide data upon which decisions on educational change, or no change, are made and implemented.[1]

Hoban's statement serves to lay the groundwork and focus for this study. If educational change is, indeed, based on data furnished by educational research, then this data must be readily available in meaningful form to be of any real value.

Investigations of the literature in the field indicate that there are two serious weaknesses in regard to information about the utilization of television in the teaching-learning process. First, there is no analytical correlation of results of completed research and experimentation to date. Second, summaries of studies which are current do not relate the data to what has been previously established.

The first serious and thorough attempt to compile and analyze the research was made late in 1955, when an entire issue of the American Psychologist[1] was devoted to television. Most of the information, however, concerned the "effects" or "impact" of commercial television on the population as a whole, although there were references to and appraisals of the utilization of television in education.

---

[1] Charles F. Hoban. *Critique on the Methodology of Research*, paper presented at the U. S. Office of Education Conference on Research in New Media, Washington, D. C. October 21-22, 1958, p. 5, (dittoed).

Another report, issued by the Pennsylvania State University,[2] presented data on the research it had conducted with television, and also included an excellent presentation of philosophy for the use of television in education. This university had been the location for extensive research in the area of instructional films, and had conducted some 80 individual research projects.

Late in 1956, Hideya Kumata compiled An Inventory of Instructional Television Research,[3] which was an excellent compilation of research and experimentation to that date. His method was to ask a series of pertinent questions, and answer them with the available data.

These reports, though relatively recent, are certainly outdated when one considers the amount of research which has taken place since they were issued.

In 1958, Niven examined Instructional Television as a Medium of

---

[1] American Psychologist, 1955, Vol. 10, No. 10.

[2] C. R. Carpenter and L. P. Greenhill. An Investigation of Closed-Circuit Television for Teaching University Courses, Instructional Television Research Project Number One (University Park, Pa.: Pennsylvania State University), July 31, 1955.

[3] Hideya Kumata. An Inventory of Instructional Television Research. (Ann Arbor, Michigan: Educational Television and Radio Center), 1956.

Teaching in Higher Education,[1] but this study offered no information concerning the use of the medium in the secondary and elementary schools. Barrow and Westley[2] analyzed communication effectiveness in terms of interferences which distract attention and mask messages. Although this study was exhaustive in theoretical approach, it was extremely limited in scope.

In addition to these compilations, there have been numerous bibliographies, which give little indication of the content and results of investigations; and research seminars and government publications which present information in a general way. In all of these reports there has been only minimal correlation and integration of the results.

One of the major difficulties in accomplishing this was stated recently by Kumata.

> Much work of late has studied ETV in various settings but without a theoretical framework for integrating the results. In such a situation it becomes hard indeed to interpret the findings of one study in the light of another where the situations are sufficiently different to engender difficulty in joint interpretation. In this state of affairs interpretive decisions must wait.[3]

There would seem to be a need, not only for an analysis of research, but also for a system or theoretical framework for correlating the results. We cannot afford to wait. Integration of the results can only become more difficult as time passes without a system for correlation.

---

[1] Harold Franklin Niven, Jr. Instructional Television as a Medium of Teaching in Higher Education, Ohio State University, 1958. (Unpublished Ph.D. Dissertation).

[2] Lionel C. Barrow, Jr., and Bruce H. Westley. Television Effects: A Summary of the Literature and Proposed General Theory, Research Bulletin No. 9 (Madison, Wisconsin: University of Wisconsin Television Laboratory), May 26, 1958. (mimeo).

[3] Hideya Kumata. A Report of the Proceedings of the National Educational Television Research Conference, Withey, S. B. (ed.). (Ann Arbor, Michigan: Educational Television and Radio Center), December 4 and 5, 1958, p. 2.

Turning to the up-to-date analyses which do not relate the data to previous research, there are several excellent publications. The principal ones are the Fact Sheets prepared by the National Association of Educational Broadcasters, the Educational Television Newsletter published by the Joint Council on Educational Television, the Radio-TV Digest, the N. E. T. News published by the Educational Television and Radio Center, and the Audio-Visual Communication Review.

For one who is aware of previous findings, these publications are an excellent source for keeping up to date. For those who are not familiar with what has already been established, it is difficult to put the information in these publications into a proper frame of reference.

It is felt that this gives further support to the statement that there is a need for a comprehensive, analytical, meaningful, and convenient collocation of research and experimentation with television in the teaching-learning process, based on a classification system which provides for integrating and correlating the results.

PURPOSE

Therefore, the purpose of this study is to analyze and correlate the available and pertinent data in this area by means of a system based on the relationship between communication and the teaching-learning process, (1) to identify what is now known, and (2) to organize this information in such a way as to make it readily and meaningfully available. Further, it should facilitate the task of determining (3) what is not known, and permit suggestions for future research.

DEFINITION OF TERMS

The major portion of this section presents the rationale for the a priori construction of the Classification System to be used in this study. It was felt, however, that setting up a rigid and inflexible system beforehand would be unrealistic, since the complexity of the data available was not completely known. Therefore, expansion and specific detailing of the system was done both during and after the available information had been collocated. These specific elements are presented in a subsequent section.

The first step, recognizing television as a medium of communication, was to investigate the literature pertinent to the communication process.

> ...human beings are unique among living creatures in that they have the ability...to transmit information and ideas from generation to generation so that each generation or person can go on from where the last left off. All human culture is the accumulated product of this time-binding capacity, which in turn is the product of man's ability to communicate through the use of symbols, including language.[1]

The parallel with the teaching-learning process is suggested by Carroll.

> Communication refers to a social relationship set up between individuals in which messages emanating from one member of the relationship may enable another member to reduce his 'uncertainty' in the sense of reducing the number of alternative interpretations open to him.

---

[1] S. I. Hayakawa. Encyclopedia Britannica, 1956, Chicago, 13, 492.

> One is tempted to draw an immediate parallel with the educative process, and it is perhaps instructive to think of the teacher as successively reducing the student's uncertainty by teaching him a series of discriminations.[1]

Lyman Bryson extended this analysis of communication in a stimulating summation of the complexity and development of it in an historical perspective.

> Communications is a term that covers a vast and varied field of human action. The mere uttered sounds, the audible symbols that make some difference in the environment of the listener and thus, as we say, convey a meaning, are in themselves difficult phenomena. When these audible symbols are represented by visual symbols such as the characters of a written language, complications arise. They are both psychological and sociological and they are hard to understand. In spite of that, of course, we go on in naive self-assurance doing what is necessary to live in community; we communicate. By the invention of printing, the complications were multiplied and now we have what we call mass media to enrich our lives and burden us with new problems; talking pictures, cheap print, and broadcasting.[2]

It also developed that many researchers have sought to systematize the communication process, to organize it into meaningful elements to permit more fruitful investigation and understanding.

Deutschmann sums up their efforts this way:

> A variety of researchers have characterized the variables of the communication process. Most agree on a list quite similar to this one:
>
> 1. The communicator (source, sometimes medium)
> 2. The message (content, sometimes stimulus)

---

[1] John B. Carroll. "Communication Theory, Linguistics, and Psycholinguistics," Review of Educational Research, 1958, Vol. 28, 2, p. 80.

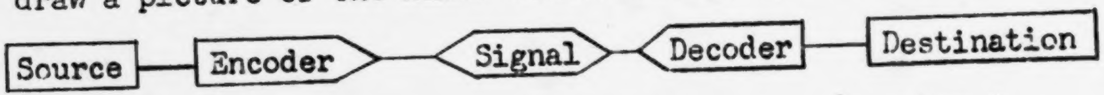
[2] Lyman Bryson. The Communication of Ideas, Institute for Religious and Social Studies, (New York: Harper and Bros.), 1948, p. 1.

3. The channel (also medium, interpersonal network)
4. The receiver (audience)[1]

Lasswell adds a final element in his construction, "Who, says what, through what channel, to whom, with what effect."[2]

Newcomb defines the simplest communicative act as, "A to B re X."[3] He must be credited also, with having clarified the concept of "sharing" symbols.

Schramm indicates a relationship with electronic means of communication.

> We are talking about something very like a radio or telephone circuit. In fact, it is perfectly possible to draw a picture of the human communication system that way:
>
> 
>
>
> Substitute 'microphone' for encoder, and 'earphone' for decoder and you are talking about electronic communication. Consider that the 'source' and 'encoder' are one person, 'decoder' and 'destination' are another, and the signal is language, and you are talking about human communication.[4]

Carpenter provides a further link concerning research with television in education. A similarity of categories with Deutschmann's summation can be noted.

---

[1] J. Paul Deutschmann. "Measurement in Communication Research," in Introduction to Mass Communications Research, R. O. Nafziger, and D. M. White (eds.), (Baton Rouge: Louisiana State University Press), 1958, p. 170.

[2] Harold D. Lasswell. "The Structure and Function of Communication in Society," in The Communication of Ideas, L. Bryson (ed.), (New York: Harper & Bros.), 1948, p. 37.

[3] Theodore M. Newcomb. "An Approach to the Study of Communicative Acts," Psychological Review, 1953, Vol. 60, p. 393.

[4] Wilbur Schramm. "How Communication Works," in The Process and Effects of Mass Communication, (Urbana: University of Illinois Press), 1954, p. 4.

> Most of the research which has been done, or might be done, with television can fairly easily and relevantly be classified in the categories familiar to psychologists. In some instances transformation of concepts or hypotheses and changes in terminology are necessary. Generally, in television research investigators will discover problems in the following broad areas:
>
> 1. Context and origin of the stimulus materials.
> 2. Characteristics and patterns of the stimulus materials.
> 3. The characteristics of individuals and audiences who react to the stimulus materials.
> 4. The situations in which reactions occur.
> 5. The effects and personal social consequences of these reactions.[1]

Analysis of this material, plus the results of work done on instructional film research, provided the foundation for constructing a system which could conveniently, meaningfully, and comprehensively handle the available data. Therefore, the following categories were established:

1. The Content, message, or stimulus materials.

2. The Communication Potential, or the possibilities for interaction between individuals, namely the teacher and student.

3. The Situation or environment, generally, the physical elements present.

4. The communicator, encoder, or teacher.

5. The listener, decoder, or student.

6. The effects, or Learning.

7. Results.

It was felt that each one of these categories would allow for the inclusion of a maximum amount of information, yet be sufficiently distinct so as to be meaningful. An awareness of what could be included, followed by an analysis of what actually has been investigated, should provide an indication of what we do not have sufficient information about, and point the way for future research.

---

[1] C. R. Carpenter. "Psychological Research Using Television," American Psychologist, 1955, Vol. 10, No. 10, p. 608.

The following detailing of each of these categories, therefore, presents an outline of what might be included under each heading.

1. Content. The sum of symbols presented to be learned.

According to Hovland,

> The study of stimuli transmitted by the communicator employs the familiar technique of content analysis...These methods provide analysis in terms of the subject matter of a communication, its thematic content, type of symbolization, kinds of rhetorical devices used, syntactical characteristics, etc.[1]

The NAEB, in Fact Sheets,[2] list course content under the following headings: Psychology, Biological Sciences, Military Training Courses, Languages, Physical Sciences, English (Composition and Literature), Social Sciences, Fine Arts, Mathematics, and Miscellaneous.

Bearing Bryson's earlier statement in mind, the types of symbolization are referred to as verbal, visual, and written. There is room for confusion here, in that written symbols are also visual. The following definitions should prove useful: (1) Verbal, including the language of oral speech and vocalizations, (2) Visual, including all kinesic movements and gestures, and (3) Written, including handwriting and printed material.

---

[1] Carl I. Hovland. "Social Communication," in Reader in Public Opinion and Communication, B. Berelson and M. Janowitz (eds.) (Illinois: The Free Press), 1953, pp. 182-183.

[2] NAEB Journal, NAEB Research Fact Sheets and Index, National Association of Educational Broadcasters, Vol. 18, No. 5, Feb., 1959, p. 2 A.

2. Communication Potential. The possibilities for interaction or exchange of symbols between the teacher and the student.

Earlier reference was made to the complications presented by the introduction of "mass media" into the communication process. McLuhan articulates these complications in greater detail.

> The use of the term 'mass media' has been unfortunate. All media, especially languages, are mass media so far at least as their range in space and time is concerned. If by 'mass media' is meant a mechanized mode of a previous communication channel, then printing is the first of the mass media. Press, telegraph, wireless, telephone, gramaphone, movie, radio, TV, are mutations of the mechanization of writing, speech, and gesture. Insofar as mechanization introduces the 'mass' dimension, it may refer to a collective effort in the use of the medium, to larger audiences or to instantaneity of reception. Again, all these factors may create a difficulty of 'feedback' or lack of rapport between 'speaker' and audience. There has been very little discussion of any of these questions thanks to the gratuitous assumption that communication is a matter of transmission...of information, message, or idea. This assumption blinds people to the aspect of communication as participation in a common situation. And it leads to ignoring the form of communication as the basic art situation which is more significant than the information or idea 'transmitted.'[1]

This passage indicates that there is a different potential for communication or interaction depending upon the media used. This is amplified by Schramm.

> ...it is possible to characterize the media as to whether they permit much or little participation on the part of the audience. Thus, a media scale might be created, running from most participation to least participation, something like this:

---

[1] Marshall McLuhan. "Notes on Media as Art Forms," Explorations, 1954, No. 2, p. 6.

personal conversation
discussion groups
informal meetings
telephone
formal meetings
sound motion pictures
television
radio
telegraph
personal correspondence
form letters
newspapers
billboards
magazines
books

> Higher degrees of social participation tend to create a sense of involvement, a group bond, a circular pattern of influence and decision making. They provide maximum feedback.[1]

After analysis of the preceding and related material, the following categories were constructed for handling entries in the Communication Potential column. The items listed in the media scale above, plus some other conditions pertinent to this study, are included in the parentheses.

I.	A	← Verbal → ← Visual →	B	(Personal conversation, discussion groups, informal meetings, some classrooms and TV originating rooms, two-way television.)
II.*	A	← Verbal → Visual →	B	(TV with audio feedback.)

---

[1] Wilbur Schramm. "The Nature of Channels," in The Process and Effects of Mass Communication (Urbana, Illinois: University of Illinois Press), 1954, p. 89.

*It is interesting to note that condition II was rare until electronic media for symbol transmission were invented. Some examples of this type, prior to electronic communication would be found in Moslem countries with veiled women, the speakeasies of the Roaring Twenties, and one-way mirrors.

III.	A ← Verbal → B	(Telephone, two-way radio.)
IV.	A Verbal → B ← Visual →	(Formal meetings, lectures, some classrooms, some TV originating rooms.)
V.	A Verbal → B Visual →	(Television, sound motion pictures, kinescopes, video tapes, demonstrations.)
VI.	A Verbal → B	(Radio, audio tapes, discs.)
VII.*	A ← Written → B	(Telegraph, correspondence, blackboards, papers and assignments, notebooks.)
VIII.	A Written → B	(Form letters, newspapers, billboards, magazines, books, study guides, reproduced lecture notes.)

Realistically more than one communication condition may occur during the period of time under investigation. For example, the most common one in education is the large lecture group followed by small discussion sessions. This entry would have to be made: IV-I. Similarly, when television is used, a discussion session often follows: V-I.

It should be pointed out that a specific category allows different techniques and methods of presentation, because of the nature of the medium used. That is, television permits the enlarging of objects, super-imposing one picture on another, split-screen, and so forth. This is illustrated in Runyon and Kanner's analysis of television utilization.

> The item-classification method consists essentially of classifying, on an *a priori* basis, all items in terms

---

*Written symbols can be presented and shared between A and B in all of the categories above, to the extent that visual symbols can be. Only under condition VII is this implicit, so that this condition may be used outside of and/or in addition to the others listed above.

of (a) nature of information tapped, (b) formulation of the item, and (c) training techniques employed in the presentation.

Nature of Information Tapped	Formulation of Item	Training Techniques Employed in Presentation
A. Pure verbal information, definitions, facts, laws, etc. B. What to do information 1. Manipulation of rules and mathematical symbols 2. Manipulation of objects C. Pure visual information, identification of objects D. Interrelationship of parts 1. Reading schematics 2. Structure and functionings of equipment	A. Verbal B. Pictorial	A. Simple audio B. Close-up C. Charts and [illegible]ead boards for printed and pictorial accompaniment to audio D. Superimposure E. Split Screen F. Blackboard[1]

3. Situation. The external physical factors defining the environment in which the teacher and the learner are located. The following analysis by Lewin is pertinent here.

> The properties of the 'life space' of the individual depend partly upon the state of that individual as a product of his history, partly upon the nonpsychologic--physical and social--surroundings....To describe a situation 'objectively' in psychology actually means to describe the situation as a totality of those facts and of only those facts which make up the field of the individual. To substitute for that world of the individual the world of the teacher, of the physicist, or of anybody else is to be, not objective, but wrong.[2]

---

[1] Richard P. Runyon and Joseph H. Kanner. "Present Status of Signal Corps Research," *Audio-Visual Communication Review*, 1956, Vol. 4, p.90. (Reprint).

[2] Kurt Lewin. *Field Theory in Social Science*, The Research Center for Group Dynamics, University of Michigan (New York: Harper and Bros.) 1951, p. 62.

Proceeding from this distinction, separate columns are allotted for entries which pertain to the situation for the teacher and the student. These are referred to as "O" for conditions at the point of origin, and "R" for conditions at the point of reception. Some of the elements which would go toward making up the field for each individual would be: the frequency, length, time, and place of the situation, the materials and equipment, acoustics, field of vision, size and arrangement of room, temperature, ventilation, light, color, requirements and assignments, number of students and other personnel such as proctors, visitors, or teacher substitutes.

4. The teacher. The measurable and/or observable characteristics which describe the individual.

In a survey and analysis of characteristics which might be used to describe a successful or effective instructor, Morsh and Wilder listed the following predictors: intelligence, education, scholarship, age and experience, knowledge of subject matter, professional information, extracurricular activities, general culture, socioeconomic status, sex, marital status, teaching aptitude, teaching attitude, interest in teaching, (motivation), voice and speech characteristics, and photographs.[1]

5. The student. The measurable and/or observable characteristics which describe the individual. A list of the elements which

---

[1] Joseph E. Morsh and Eleanor W. Wilder. Research Bulletin AFPTRC-TR-54-44, Identifying the Effective Instructor: A Review of the Quantitative Studies, 1900-1952, Training Aids Research Laboratory, (Illinois: Chanute AFB), Oct., 1954, pp. 119-22.

could be used to describe the student in the teaching-learning process can be found by analyzing and examining research in the area. With minor alterations, the list is similar to the one offered for the teacher; intelligence, education, scholarship, age and experience, knowledge of subject matter, extracurricular activities, general culture, socioeconomic status, sex, marital or peer group status, aptitude, attitude, voice, speech, and physical characteristics, and interest in learning (motivation).

The last characteristic plays a determining role in the teaching-learning process. Rasey illustrates this point, in reference to a student.

> He focuses (or refuses to focus) his appropriate energies in response to certain stimuli, because of the judgment he has made on the basis of effective values, residual from previous experiencing with the situations which his percepts and concepts relate to this fresh situation. Practically, he tried because he thinks an effort worthwhile, or, conversely, he refuses to try, because he does not consider it worthwhile.[1]

Again, in reference to the student, Miller groups

> ...the problems involved in teaching-learning under certain fundamental factors. These are:
>
> a) Drive, or as it is often called, motivation. The student must want something.
>
> b) Cue, or as it is often called, stimulus. The student must notice something.
>
> c) Response, or as it is often called, participation. The student must do something.
>
> d) Reward, or as it is sometimes called, reinforcement. The student must get something that he wants.

---

[1] Marie I. Rasey. Toward Maturity. (New York: Hinds, Hayden, & Eldridge, Inc.) 1947, p. 154.

> Finally, I shall discuss a number of research problems and practical principles which do not fit neatly under any single one of the foregoing four factors...forgetting and review...logical learning, generality, and creativity... speeding adjustment to new needs and opportunities.[1]

6. Learning.

> Learning is the process by which an activity originates or is changed through training procedures (whether in the laboratory or in the natural environment) as distinguished from changes by factors not attributable to training.[2]

As Hilgard himself states, this definition is not entirely satisfactory, does not define training procedures, and is partly tautological. He uses it as a basis for further discussion.

Lewin describes four different types of changes which are considered learning.

> Within what is called learning, we have to distinguish at least the following four types of changes: (1) learning as a change in cognitive structure (knowledge), (2) learning as a change in motivation (learning to like or to dislike), (3) learning as a change in group belongingness or ideology (this is an important aspect of growing into a culture), (4) learning in the meaning of voluntary control of the body musculature (this is one important aspect of acquiring skills, such as speech and self-control).[3]

Bloom[4] considered three "domains": cognitive, affective, and psychomotor; and expanded them in an exhaustive classification of the goals of our educational system.

---

[1] Neal E. Miller. "Principles of Learning by Televised Instruction." in College Teaching by Television, J. C. Adams, C. R. Carpenter, and D. R. Smith (eds) (Washington, D. C.: American Council on Education), 1958, pp. 29-42.

[2] Ernest R. Hilgard. Theories of Learning (New York: Appleton-Century-Crofts, Inc.) 1948, p. 4.

[3] Lewin, op. cit., p. 66.

[4] Benjamin S. Bloom (ed.). Taxonomy of Educational Objectives (New York: Longmans, Green and Co.) 1956.

There is an obvious relationship between the elements listed here and those mentioned in the section regarding the student. Separate treatment is given so that it can be determined what a student brings into the teaching-learning situation, and then what changes took place.

All of the preceding elements which make up the framework of the Classification System involve proposals and hypotheses to some extent.

> Each one may be utilized, however, as a frame of reference for the conduct of learning and teaching in the school or elsewhere. This is because it is possible to a considerable degree to determine the external conditions under which modification of behavior—that is, learning—is most readily accomplished.[1]

7. Results. Implicit in this discussion has been the assumption that the elements in the preceding categories have been the object of investigation, evaluation, and measurement. Results fall into three general types. (1) Whether or not there is evidence of learning, (2) whether or not there is a difference in the amount of learning, depending upon the variable under investigation, and (3) whether or not there is a relationship between variables which may or may not be an influence in the teaching-learning process.

A set of symbols was developed to use in charting data on the system. These were extended and detailed as entries were made; the complete group of symbols appears in an Appendix, but these present an idea of the more general ones used.

> favored over

# no significant difference, or relationship

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[1] Louis P. Thorpe and Allen M. Schmuller. Contemporary Theories of Learning (New York: The Ronald Press Co.), 1954, p. 450.

+ positive (either for correlation or evidence of learning)

- negative

: results follow

/ relationship or correlation

L-Learning

S-Situation

C-Content

P-Personal Attributes (characteristics of teacher and/or student)

CP-Communication Potential

O-Point of origin and/or Originator (teacher)

R-Point of reception and/or Receptor (student)

Numbers are used to refer to specific items which are detailed at the head of each column or category.

This, then, is the rationale for the system. Some further definitions appear in the following sections which outline the limitations, scope, and procedures.

LIMITATIONS AND SCOPE

An analysis of the pertinent research published or available through personal solicitation and a search of the literature is to be made on the basis of the preceding Classification System. The cut-off date is December 31, 1958, selected for practical purposes, and as a convenient date which would allow yearly summaries to be added.

Reports from January 1 to March 31, 1959, are included, however, at the end of the Classification System appendix.

This study does not contain all the research which could justifiably be treated under this Classification System. It is limited to analyzing and collocating research in which television was actually utilized. Since much of the experimentation involved a comparison between television presentation and the "conventional" classroom, provision had to be made for the latter. It is also felt that present experimentation with television can benefit from previous research in the teaching-learning process, which was done without television. This system provides for the integration of such data, but it is outside the scope of this study.

Incidentally, there are a number of teaching-learning situations which could be classified as "conventional," and this results in ambiguity and lack of clarity. This deficiency in the use of the term is corrected through clarifications outlined in the Communication Potential and Situation sections. Distinctions can be made between "lecture" and "discussion" type groups, as well as between "large" and "small" classes, and other elements of interest in comparing different means, methods, modes, and media of presentation.

Despite the fact that the system was designed for specificity in recording research, there are obvious limitations imposed by the research reports themselves.

First, there is a difficulty in generalizing from the data, due in part to lack of coordination between researchers in definition of terms and control of the elements involved. This point has been touched on earlier.

Second, there is a quality limitation, due to the conduct and methodology of the studies. As Kumata stated in his Inventory of Instructional Television Research:

> What can be said about the studies which have been made? On the whole, the quality is disappointing. A

> great deal of this is due to...lack of careful planning and exacting evaluation. The most systematic and perhaps the best studies have been those which have been sponsored by the military or supported by foundation grants. In these cases, however, the controlling personnel have been researchers and almost all of the studies have been closed-circuit.[1]

A brief review of the methodology of controlled experimentation should help clarify this point. Stouffer presents the preferred model, plus a discussion of variations.

	Before	After	After-before
Experimental group	X_1	X_2	$d = X_2 - X_1$
Control group	X'_1	X'_2	$d' = X'_2 - X'_1$

> The test of whether a difference d is attributable to what we think it is attributable to is whether d is significantly larger than d'[2]

As is the case with some of the studies under consideration here, Stouffer goes on to say that sometimes there are only the two top cells, sometimes only the "after" cells, and sometimes just one cell. He concludes:

> When this happens, we do not know much of anything. But we can still fill pages of social science journals with 'brilliant analysis,' if we use plausible conjecture in supplying missing cells from our imagination.
>
> I do not intend to disparage all research not conforming to the canons of controlled experiment....What

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[1] Kumata, op. cit., p. 3.

[2] S. A. Stouffer. "Some Observations on Study Design," in Reader in Public Opinion and Communication, B. Berelson and M. Janowitz, (eds.),(Glencoe, Illinois: The Free Press), 1953, p. 520.

> I am arguing for is awareness of the limitations of a design in which crucial cells are missing.[1]

The research treated in this study is further limited in the following manner. The Content has been determined by individuals whose principal concern is to educate, not entertain; and, the television audience is known or equated with a control audience. For example, with almost all broadcast television, comparisons and relationships between elements as conceived in this system are difficult, if not impossible, since the characteristics of the audience are usually unknown at the start.

When the characteristics of the audience are pre-determined, however, it is possible to obtain more meaningful information on relationships and influences in the teaching-learning process.

To exercise control over the composition of the audience, researchers have utilized what is usually referred to as closed-circuit television. This term commonly means transmission of an electronic signal by cable rather than through broadcast channels. Yet this use is too restrictive, since many valid experiments have been conducted using broadcast television, in which the characteristics of the audience were known and equated, by having specific points of reception.

As has been stated before, this study focuses on learning and the individuals who do the learning. Therefore, it includes research and experimentation which measured and evaluated the individuals to be educated regardless of where they were located. The usual distinctions between "broadcast" and "closed-circuit" are thus irrelevant here. The term used in this study to refer to the preceding limitation is "instructional" television.

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[1] *Ibid.*, pp. 522-524.

Further, it is obvious that there will be overlapping and repetition of material, since it is difficult to mention one element without making reference to another. The resultant redundancy, however, may well serve the purposes of this study by helping to clarify and set in perspective the material treated.

Conversely, any means of codifying or symbolizing involves a certain loss of detail and information. It is felt, however, that this system realizes the optimum between the cumbersome and the inadequate.

Finally, it must be re-emphasized that the purpose of this study is to analyze and collocate pertinent research in the utilization of television in the teaching-learning process. Advocacy of any element examined here is not intended. In short, this compilation must be regarded soberly. The conclusions are not to be used in a manner similar to that in which an inebriate uses a lamppost. Rather, the purpose here is illumination, not support.

PROCEDURES

All items or elements in the Classification System are regarded as conditions extent in a teaching-learning situation. They can also be considered as variables, when viewed in the perspective of evaluating and measuring learning.

The procedure followed in subsequent chapters is as follows.

Chapter Two is a detailed presentation of the development of the system as a result of analyzing and recording relevant data. It can be regarded as a key to reading and translating the information, which is in the form of symbols, from the tables of the system.

Chapter Three details the collocated findings concerning the elements which have been investigated and evaluated.

Chapter Four presents results and conclusions drawn on the basis of what is now known in regard to the utilization of television in the teaching-learning process. What is not known, determined from blanks in the Classification System, is indicated and followed with suggestions for future research. All of the recorded data appear in the Classification System appendix. Other appendices provide a summation and cross-indexing of the data analyzed by the system, to provide easy access to information regardless of the frame of reference of inquiry.

It is realized that all of the elements in the system are interacting and dynamic. Separating them is not truly representative of the teaching-learning process, but is done for the purpose of analysis and correlation in hopes of finding specific meaningful elements and relationships which can be used to produce "the external conditions under which modification of behavior--that is, learning--is most readily accomplished;"[1] and thereby provide "data upon which decisions on educational change, or no change, are made."[2]

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[1] Thorpe and Schmuller, op. cit.

[2] Hoban, op. cit.

CHAPTER II

CLASSIFICATION SYSTEM DETAILS

The first chapter described the basic framework used for classifying information from investigations of television in the teaching-learning process. This chapter describes in detail the elements which comprise the system. In a sense, then, this chapter serves as a key to reading and interpreting the entries which are made on the system. An appendix contains all the studies and entries resulting from them.

In recording studies, since they would have to be discussed and frequently referred to, some method of notation had to be established. Also, there is reason to believe that knowing at least the year in which the study was reported would help in appraising the material, and give an idea of the directions which investigations with television have taken.

Therefore, it was decided to classify the studies according to year, arrange them alphabetically within each year, and then number them consecutively. This procedure also helps distinguish between several studies done by the same author. A typical entry then, would be made in this manner: Brandon (56-2). The century has been dropped from the year designation to further simplify the reference. This example would be interpreted to mean a study done by Brandon, reported in 1956, and is the second study in an alphabetical listing of the studies done that year. These entries are made in the first column in the Classification System, which is headed, "Investigator."

The second column is entitled, "Content and Level." Entries concerning Content (C) are made according to the descriptions given by the investigator, e.g., psychology, "Thinking Through Language," Wave Shaping Circuits, and so forth. In parentheses, following each Content entry, is a designation for the level of the Content. Numbers 1 through 12 indicate the first twelve grades of schooling. The abbreviations F, So, J, Sr, and G refer to various levels of college and university Content. When the grade level is not specifically mentioned by the author, the abbreviations ES, HS, and U, are used to refer to elementary school, secondary school, and college or university. The capital letter (M) refers to studies done by the military, and small letter (m) is used for miscellaneous studies in which the level of the Content is not sufficiently clear to allow for any of the other designations.

The third column is headed "Communication Potential" (CP). Roman numerals designate various conditions for the exchange of symbols. General terms which are used to refer to them are as follows:

I - small-discussion type
II - television with audio feedback
III - two-way audio
IV - large-lecture type
V - one-way television
VI - one-way audio
VII - correspondence
VIII - printed or written

That these descriptions are not exclusive is illustrated by Becker, et al, (58-2). The possibilities for discussion were examined under small group conditions (I), television with audio feedback (II'), and large-lecture group (IV). The results indicated that more discussion took place under condition I, less in II', and still less in condition IV.

Several sub-categories have been added to allow more detailed and exact analysis of these general conditions. All of these symbols are not applicable to all Communication conditions, and this is further reason why they are sub-categories.

Small letters have been used here, in the following manner.

a - lecture, demonstration
c - laboratory, practice
d - discussion
f - film
g - immediately following
h - delayed
i - interview, panel
k - kinescope
o - originating room
q - question and answer
' - electronic means of transmission

Most of the sub-categories above are self-explanatory, but some of them need elucidation. The designations "g" and "h" were found to be necessary to accommodate entries which concerned follow-up sessions of television presentations. In some studies these periods came immediately after the television presentation; in others they were delayed for a certain amount of time, often a day or two.

The dash is used to indicate a follow-up session, for example, V'-I. A double-headed arrow indicates rotation of the students between the conditions on either side of the arrow: IVo↔V'.

The "o" symbol is used to differentiate between groups of students who are present in the originating room of a television presentation, and the receiving room students.

The prime symbol, ('), is used to designate electronic transmission. For instance, in some cases it is necessary to distinguish condition I, face-to-face mutual exchange of visual and verbal symbols; and condition I', electronic exchange of visual and verbal symbols. Another example would be found in condition V, one-way direction of visual and verbal symbols with the use of kinescopes and films. A film transmitted electronically would be recorded: V'f; if it were shown on a projector, it would be recorded: Vf. Likewise with a kinescope: V'k or Vk.

The Situation (S) comes next in the system. Capital (O) designates entries at the point or origin, and capital (R) is used for entries at the point of reception, where such distinctions need to be made.

There are seven major categories in the Situation, designated by arabic numerals.

1. Frequency, length, and time
2. Number of students
3. Physical arrangement and location

4. Temperature, ventilation, light, and color
5. Assignments and requirements
6. Unique utilization of Communication conditions
7. Other personnel and supervision

Sub-categories were necessary for certain of the above. For these, arabic numerals are placed to the right of the decimal point.

For frequency, length, and time, the following designations were made.

.1 one day, single
.2 two days
.3 three days
.4 one week
.5 two weeks
.6 three weeks
.7 one month
.8 two months
.9 three months or longer

.01 15-20 minutes
.02 30 minutes
.03 50-60 minutes
.04 two hours
.05 three hours
.06 four hours
.07 five hours
.08 six hours
.09 seven hours or longer

By way of illustration, an entry of V'-Ig in the Communication conditions column, followed by an entry of 1.32-1.31 in the Situation column, indicates that students received one-way television presentations one-half hour in length for three days a week, which were immediately followed by small-discussion type conditions 15-20 minutes in length three days a week.

When the entry 1.1 (single) is followed by a small (t) in parentheses, it indicates that an immediate post-test was given.

Sub-categories in the number of students are as follows.

.1 25 or less
.2 26-50
.3 51-75
.4 76-100
.5 101-125
.6 126-150
.7 151-175
.8 175-200
.9 201 or more

The following designations are used in the physical arrangements and locations category.

.1 front
.2 middle
.3 rear
.01 classroom
.02 lecture hall
.03 home

Under temperature, ventilation, light, and color, the sub-categories are:

.1 temperature
.2 ventilation
.3 lighting
.4 color
.5 black and white
.01 high
.02 average
.03 low

For assignments and requirements the following designations have been made.

.1 reading
.2 written work
.3 presentation
.4 required
.5 optional
.6 independent study

Sub-categories in the unique utilization of Communication conditions are designated as follows:

.1 maximum

.2 average

.3 minimum

Under the personnel and supervision section are found these subcategories.

.1 no supervision

.2 partial supervision

.3 full-time supervision

.4 supplementary instructor or aide

.5 visitors

This detailing of the Situation has proven to be satisfactory to handle the material to be recorded on the Classification System. In a few isolated cases written notation is necessary for the sake of clarity.

The fifth heading is entitled Personal Attributes, (P). As with the Situation, capital (O) represents the point of origin and the teacher; capital (R) stands for the point of reception or student. When neither appears, the entry refers to the student. There are nine major categories which apply here.

1. Intelligence, aptitude, grade point average, test scores, and educational background. Most of the studies have used one or another of these measures to classify students.

2. Experience. This is the common term used to describe the qualifications of a teacher in the studies.

3. Age

4. Sex: M-male, F-female
5. Extracurricular activities
6. Auding or listening ability
7. Socioeconomic or peer-group status
8. Physical
9. Attitude, interest, motivation, level of aspiration.

The following designations are used to supplement all of the above categories in the Personal Attributes section.

.1 - high, favorable, above average

.2 - average, neutral

.3 - low, negative, below average

The next column is headed Learning, (L), and is detailed in the following manner.

1. Cognitive structure
    .1 - Information gain, achievement
    .2 - Problem solving, critical thinking, complex relationships, comprehension, application, analysis, synthesis, evaluation.
2. Motivation (like or dislike)
    .1 of the Content
    .2 of the Communication Potential conditions
    .3 of the Situation
    .4 of the teacher or instructor
3. Group belongingness, socialization, authoritarianism, tolerance, prejudice.
4. Psychomotor skills, increased control of the body musculature.

Two small letters are used to represent retention, (r), and prior or control data (p). Wherever possible, the length of time between original and retention tests is indicated by a numerical subscript, which gives the time in days; for example, $L1.1r_{30}$.

The last column is entitled Results. In it entries are made which record the outcome of the experiment reported by the investigator.

It should be noted that entries are made in the Situation (S) and Personal Attributes (P) columns only when that specific element was subjected to investigation.

This detailing is a result of many arbitrary decisions which had to be made to determine whether a particular variable would be treated in one column or another. This is particularly true of the Content (C), Communication Potential (CP) and Situation (S) columns.

Every precaution has been taken to insure the accuracy of the entries. They can only be as accurate and detailed as the study from which they are taken. Many studies are vague and inexplicit; where there was any question as to the accuracy of information, an entry was not made, rather than make one which might be misleading. Many reports were omitted entirely on this basis, as well as because they were not within the scope and limitations of this study.

Before presenting an exposition of the Results, a sample entry for the Classification System follows.

Inv.	C	CP	S	P	L	Results
Willis 56-12	Algebra (HS)	I V'			1.1	L1.1:CP#

This entry reads: In a high school algebra course, Willis (56-12) found no significant differences in information gain among students who were compared under small-discussion type conditions (I), and one-way television conditions (V').

We turn now to the correlation of results from investigations of television in the teaching-learning process.

CHAPTER III

CORRELATION OF ELEMENTS

The entries made on the Classification System fell into three general types: (1) whether or not there was evidence of Learning, (2) differences, if any, in the amount and kind of Learning, depending upon the specific element treated, and (3) the relationships and relative importance of variables which determine what elements interact, and with what effects.

Early in the process of analysis, it became obvious that there was little question about the fact that students with different Personal Attributes learned under various Communication conditions and Situations, in a wide variety of Content areas. This being the case, a decision was made to eliminate entries of this type, (L+), unless this was the only result reported by the investigator. It should be understood, then, that in every study, which does not contain an entry of this first type, there is an implicit assumption that Learning did take place.

It follows, therefore, that all but a few of the entries are of the second and third types mentioned above. Seventy-five reports are included, but it must be noted that a few of the studies have been more extensive and thorough than the majority; in scope, attention to detail, and elements treated. This explains why more than half of the entries come from just nine studies.

The Content of the reports covers a broad area, but the bulk of the work was done in the following fields: Psychology; Mathematics; English, Speech, and Communication; Natural, Physical, and Social Sciences; and the Military. Some attention has been given to courses in Education, Business, and Languages.

The Results are presented in the order of the different kinds of Learning measured (L1, 2, 3, 4.).

L1.1,C,CP--Communication Conditions, Content, and Information Gain

By far, the greatest number of comparisons, 281, concern information gain and achievement (L1.1) under various Communication conditions (CP). The overwhelming majority of them, 246, indicate no substantial difference in the amount of information gain due to variations in Communication conditions, while 35 do indicate differences.

Although almost every combination of Communication conditions was examined, the bulk of the studies concerned:

The small-discussion type (I)
The small-discussion type originating room (Io)
The large-lecture type (IV)
The lecture type originating room (IVo)
Television with audio feed back (II')
One-way television (V')

Forty-eight comparisons showed no substantial difference between conditions I and V', four showed V' over I, and six showed I over V'.

Thirty-one comparisons between lecture type (IV) and one-way television (V') did not indicate differences, three showed V' better than IV, one showed the opposite result.

Fifty-five comparisons between I and II' turned up no great differences, ten placed I over II', and two showed II' better than I.

Forty-two comparisons between Io and II' indicated no substantial differences, one study showed II' over Io, and there was one case of the opposite result.

Forty-six comparisons showed relatively little difference between Io and I, while there were two instances of I better than Io.

There were eleven comparisons which showed no difference between IVo and V', and four reporting similar results comparing one-way television (V') to television with audio feedback (II').

The remaining nine comparisons showing no substantial differences involved other combinations of the above conditions, plus television with audio feedback serving as an originating room (II'o).

The other five comparisons which indicate differences were: one-way television (V') over audio-only (VI'); VI' over V' over I over printed material (VIII); V' over VI' over VIII and IVo; kinescope (Vk) over V' over IV over VIII; and Vk over V' over I over a group which rotated between Io and V'.

From the relatively few comparisons which have indicated differences in achievement and information gain, due to gross comparisons of Communication conditions, it appears that (1) small-discussion type shows a small edge over one-way television, (2) one-way television is slightly favored to large-lecture type, (3) small-discussion type is much better than television with audio feedback, (4) small-discussion type originating room is about equal to television with audio feedback, and (5) small-discussion type is favored over small-discussion type originating room. Also, there is conflicting evidence as to whether television is more effective than radio, but little doubt that both are better than printed material. The sub-category of kinescope is treated in more detail shortly.

The Content of the studies exhibiting difference points towards television favoring the sciences, and conventional favoring English, speech, and communication.

With this general over-all appraisal in mind, we turn to a more specific analysis of elements in the system and information gain.

Sub-categories of Communication conditions have seen very little investigation. The major portion of the work has been with the kinescope (k) and motion picture film (f).

Rock, et al, (52-3) found II' equal to or better than Vk in 84% of comparisons made, and Vk equal to or better than IV in 75% of the comparisons.

Jackson (52-2) found that when a film or kinescope was described as a kinescope, greater information gain resulted than when a film or kinescope was described as a film. Hurst (55-5) replicated this study three years later and came up with the opposite results.

Kanner, et al, (54-5) found no significant differences between conditions IV and V'k in six of seven tests; the one significant difference favored V'k.

Parsons (57-14) found no significant differences in information gain between conditions I, Vk and correspondence (VII).

Husband (54-4) reported Vk greater than V', greater than I, greater than a group of students who rotated between Io and V'.

Tannenbaum (56-10) found Vk better than Vf and V', which were better than IV.

Irwin and Aronson (58-12) found no significant differences in total test scores between live and film lectures under conditions Io, Vf, and V'f.

Kanner, et al, (58-13) reported no significant differences between live and kinescope lecture presentations under condition V'.

In other sub-categories, Davies, et al, (57-5) found no effect on achievement under condition II' in comparisons made between three groups of students: one group allowed to ask questions (q) at any time, the second group had to ask them at a specified time, and the third group was not allowed to ask any questions.

Brandon (56-2) compared the discussion (d), straight talk (a), and interview (i), methods of presenting information under condition Vk. Results showed no signficant differences in information gain. Earlier, Vernon (53-1) had found information gain greater under condition V'a, than under V'd.

The results from the sub-categories of Communication conditions are few and contradictory, but they seem to indicate that for the learning of facts and information presented under condition V, the straight talk produces the greatest gain, whether it is live, on film, or kinescope.

These results also indicate that students learn as well (often better, never worse), from kinescopes and films as they do from other

Communication conditions.

Situation and information gain (L1.1, S)

By definition, every study, every teaching-learning situation, involves all of the elements included here. Only those results, however, which come from specific experimentation with elements of the Situation are presented in this section.

L1.1, S1 - Frequency, length, time, and information gain.

Only three studies have reported experimental comparisons in regard to the frequency, length, and time involved in the presentation of information by means of television, and conventionally.

Desiderato, et al, (56-4) determined that learning of information presented by means of one-way television (V') for one-half hour was not significantly different from information gain of trainees who had been in large-lecture conditions (IV) for nearly twice that length of time. It was also determined that when the same amount of time was used to present information under V' and IV, the trainees in condition V' evidenced greater information gain.

In another study, reported by Kanner, et al, (58-13), the results indicated that information gain of trainees in one-way television and lecture type conditions for five days a week eight hours a day, was greater than that of trainees in a one-way television condition three days a week eight hours a day. The same amount of information and the same examinations were given under all conditions, although the V' three-day group had less time to complete the examinations. The loss in teaching effectiveness was not as great as the reduction in training time, i.e., the amount of time saved exceeded the loss in learning.

The third study, reported by Honig, et al, (58-11), found no significant difference in information gain of students who had a three-hour laboratory period compared to students who had two hours of laboratory and one hour of one-way television presentation. The same investigator found a savings in laboratory instructor time in an earlier study (57-9).

Becker, et al, (58-1) suggests that a savings in instructor time can be effected, since no significant differences in information gain resulted from a Bibliography group (VIII), Kinescope group (Vk), and Regular group (I).

These results indicate the possibility that utilization of television may effect certain savings in time in the presentation and learning of information.

S1.1t - Single presentations, immediate tests.

An examination of the studies which measured learning immediately after presentation of Content was made on the premise that these results might give a better indication of information gain attributable to the Communication conditions under investigation, than would Results which allowed exposure of the student to time and other sources which might affect test scores.

That is, most of the studies, particularly at the University level, involve a period of weeks or months, usually an academic quarter or semester. There is a possibility then, that the test does not measure only the condition said to be under observation. Other factors may be involved, especially a textbook, which may be consulted by a student preparing for an examination, thus altering his score. Conversely, forgetting may take place over a period of time.

Immediate post-tests, however, though they may have other limitations, give a better indication of information gain from the specific Content presented.

Ten studies are relevant here. Rock, *et al*, (52-3) found television with audio feedback (II') better than or equal to lecture presentation (IV) in 80% of the comparisons, II' was better than or equal to Vk in 84% of the comparisons, Vk was equal to or better than IV in 75% of the comparisons.

Williams (54-6) reported significant differences favoring V' over VI' over VIII and IVo.

Anderson and VanderMeer (54-2) found no significant differences in immediate post-tests for students under conditions IV and V'.

Kanner, *et al*, (54-5) found no significant differences between trainees on twelve of fifteen tests under conditions IV and V'. Three significant differences favored V'. In comparisons between V'k and IV conditions, six tests yielded non-significant differences, one test favored V'k.

Frank (55-4) found differences favoring V' over VI'.

Desiderato, *et al*, (56-4) reported that trainees under condition V' did significantly better than those under IV.

Tannenbaum (56-10) found significant differences favoring Vk over V' and Vf, over IV. An interesting aspect of this study is that the Vk group received all the information during a four-hour period in one day and had the immediate post-test, while the other groups were not tested until the end of a four-week period.

Carpenter (57-2) found significant differences favoring VI' over V' over IV over VIII.

Kanner, et al, (58-13) reported no significant differences between trainees under conditions V' and I.

Kumata (58-17) reports the only Results which show television students (V') gaining less than lecture (IV).

These Results strongly suggest that when immediate post-tests are administered, students exhibit the same or greater information gain, when electronic Communication conditions are compared to conventional.

Three other studies which gave immediate post-tests report other data pertinent to the time of presentation and Content. All utilized kinescope or television only conditions to present information to students.

Vernon (53-1) found that important statements and generalizations were less likely to be recalled if they occurred at the end of the program.

Brandon (56-2) found that the greatest information gain resulted from information presented in the middle of a 30-minute program, less from the final 10 minutes, and least of all from the first third. Jorgenson (56-6) found the order to be: final, middle, and first segments. These studies present conflicting data for the recency-primacy argument.

One other study investigated the number of items which could be presented and learned in specific amounts of time. Hard and Watson (55-5) found no substantial differences in the percentage of items learned when 15 terms were presented in 15 minutes, 20 terms in 19 minutes, and 25 terms in 25 minutes. In other words, the group which was exposed to the greatest number of terms learned more than those who received lesser amounts, but this was in proportion to the amount of time for the presentation.

L1.1, S2 - Information gain and number of students.

Carpenter and Greenhill (58-5) made the only study of the number of students in a television receiving room and information gain. They found differences on only one examination in one course, and the differences were not systematically related to class size. They discount this one instance, since five other comparisons which they made evidenced no significant differences.

It should be noted that the reason why more specific information on this point is not available seems to lie in the tendency of investigators to equate the discussion and question and answer methods with small classes, the lecture method with large classes, and hold the number of students per television receiver to an average of 25.* These studies have been treated as Communication conditions in an earlier section of this chapter.

L1.1, S3 - Information Gain and Physical Arrangement.

Three studies, Carpenter and Greenhill (58-5), Tannenbaum (56-11), and the Los Angeles report (58-18), compared information gain with the placement of students in the front, middle, or rear of a room. None indicated any significant differences in achievement. Again, there was an established guide* for minimum (approximately twice screen size) and maximum (approximately screen width expressed in feet) distances from a television receiver. No study exceeded these limits.

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*These figures are based on early studies which, although they did not measure learning, established certain guides for television utilization.

Three studies equated students who viewed at home with students in class.

Mullin (57-12) found no significant differences in achievement between students due to receiving television instruction at home or in the classroom.

Erickson and Chausow (58-9) found seven comparisons yielded no significant differences, and two which favored the home television students over small-discussion type classes.

Dreher and Beatty (58-7) found no significant differences in four Content areas due to receiving instruction by television at home or in the classroom, or in conventional small-discussion type classes.

L1.1, S4 - Temperature, ventilation, light, color, and Information Gain.

Although some investigators have expressed concern for these aspects of the situation at the points of origin and reception, there has been no experimental evaluation measured by information gain.

The principal concern of investigations in this category has been with color, and the lack of it, when television is utilized to present Content. Logically enough, this concern showed itself only in areas where investigators or instructors felt that color was an important factor in the Content to be learned, i.e., chemistry, physics, and printed advertising.

Honig (57-9), Carpenter and Greenhill (58-5), and the Los Angeles report (58-18) stated that compensation was made for this felt deficiency of television by presenting color materials conventionally or by means of color slides to television students. No differences in information gain were noted.

Jackson (52-2) evaluated learning by comparing trainees who were exposed to a black and white film described as a kinescope, against those who received the same Content by means of a color film. No differences in information gain were found.

Kumata (58-16) noted the fact that advertisements which were part of the Content for a course in journalism were presented in color to a small-discussion type group, in both color and on television in black-and-white to an originating room group, and in black-and-white only to a television receiving room group. In reporting the results of this study, however, Kumata stated that he felt the color element of the Content was not sufficiently isolated to permit comparisons of information gain.

I1.1, S5 - Assignments, requirements, and information gain.

Two studies reported on experimentation of requirements with information gain. Carpenter and Greenhill (58-5) examined achievement when attendance at television presentations was required or optional. No significant differences in attendance or information gain were reported. They also evaluated information gain between students who had workbooks whose completion was required or optional, and a group who had no workbooks. No significant differences were found between the groups who had the workbooks, although they did show a gain in information contained in the workbooks which the students without workbooks did not.

Honig, et al, (58-11) evaluated information gain of students in a three-hour laboratory period with optional attendance at a television presentation, compared to students who were required to attend a one-hour television presentation plus a two-hour laboratory. No significant differences were found.

L1.1, S6 - Unique Utilization of Communication conditions and information gain.

Studies in this category are distinguished by the terms maximum or highly visualized, and minimum. Experimentation has been prompted here because of the visual potential of television. Two types of investigations have taken place; one compares maximum utilization in different Communication conditions, the other compares maximum and minimum presentations with only television as the Communication condition.

In the latter type, Carpenter and Greenhill (58-5) found greater information gain resulting from minimum utilization in Air Science Content, and no significant difference in a psychology course.

Klapper (58-14) found minimum utilization produced greater learning than maximum in a course entitled Man's Cultural Heritage.

Ulrich (55-9) reported greater learning among eighth grade students in a lecture with visual aids, compared to a lecture without visual aids.

Jorgenson (56-6) found no significant differences in the learning of the same verbal content presented with film clips, still pictures, or speaker only.

Vernon (53-1) states that one commentator giving facts and information produces the greatest gain in information.

Rock, et al, (52-3) found the least effective programs were those in which considerable time was spent dramatizing the lesson material while the instructor who described the action was not shown. It was stated that direct narration and animated film were effective.

In studies which compared maximum treatment under different Communication conditions, Carpenter and Greenhill (58-5) reported no significant differences between one-way television and large-lecture in psychology and music appreciation courses.

Dreher and Beatty (58-7) found no significant differences between a maximized television presentation and conventional small-discussion type groups, in psychology, basic communication, creative arts, and economics courses.

Davies, et al, (57-5) stated that no significant differences turned up when visual aids were utilized under conditions I and II'.

Irwin and Aronson (58-12) examined highly visualized film presentations, and verbal presentations, under conditions IVo and V'. No significant differences were reported when the total information presented was tested. In specially constructed examinations, however, scores were higher on objective tests for the verbal material, and higher on the visual tests for the material contained in the film presentations. There were no significant differences between the originating room and the television receiving room.

A study by Kumata (58-15) measured "relevant" and "irrelevant" Content of visual material of students in small-discussion type (I), originating room (Io), and television with audio feedback (II') conditions. In the learning of "relevant" information, students under condition I learned 75.8%, Io 50%, and II' 31.6%. Kumata presents an hypothesis which helps in understanding his results and the others presented in this section. "To the extent that visual material is successful in catching attention, to that extent will it interfere with the learning of verbal material which is trying to synthesize and organize principles based on the visual material."

Ll.1, S7 - Other Personnel and Supervision, and Information Gain

Carpenter and Greenhill (58-5) determined that full-time, partial, or no supervision produced no significant differences in information gain by students in Air Science, psychology, and psychology of marriage in-courses. Also, no significant differences resulted from comparing information gain of students in the Air Science course who were supervised by regular officers, cadet officers, or peers.

This completes the presentation of the data available regarding the Situation and Information Gain.

Personal Attributes and Information Gain (Ll.1, P)

All the information reported up to this point has discussed achievement of students equated by means of intelligence test scores, grade point average, knowledge of the Content, age, sex, and other attributes which can be used to identify an individual.

This section examines the learning of facts and information on the basis of differences between students, to determine if there are certain types of individuals who might benefit more from one type of Communication condition than another.

L1.1, P1 - Intelligence and Information Gain

Twenty studies examined the amount of information gain in various comparisons of the Communication conditions according to high and low groups of students.

Thirteen of these studies found no substantial differences between one-way television, small-discussion type, and large-lecture.

Seven studies did find significant differences. Kanner, et al, (54-5), in fifteen tests of information gain in Army Basic Training Content, comparing one-way television (V') with large-lecture type (IV), found no significant differences among the high scoring students (P1.1), but did report eight differences, out of the fifteen tests, among the low group (P1.3) favoring V' over IV. The author states that the tests had a low ceiling, which may have accounted for the lack of distinctions among the high group.

At Los Angeles (58-18), in a history course comparing conditions I and II', the high group (P1.1) fared better under condition I, the low group (P1.3) better under condition II'.

Pollock (56-8) in comparing V' and I, found no significant differences among the high group; condition I was favored to V' for average (P1.2) and low (P1.3) in a composition course; and V' was favored to I for P1.2 and P1.3 in a literature course.

Klapper (58-13) found no differences in achievement for the high and average groups in a composition course. The low group scored higher in V' than in I.

In an English course, Seibert (58-20) found no differences between conditions I and V' for P1.2; P1.1 was favored under condition V';

and Pl.3 was favored under condition I.

In a mathematics course, Seibert (58-21) compared high and average groups. He found no difference for the average group, V' was favored to IV for the high group.

Fritschel (57-6) in a general psychology course, found V' over I for Pl.1, no difference for Pl.2, and I over V' for Pl.3.

These results indicate that for the high group (Pl.1): television groups scored higher in English, mathematics, and psychology; small-discussion type higher in history. The average group (Pl.2) scored higher under television conditions in literature, and higher under small-discussion type in composition. The low group (Pl.3) did better in Basic Training courses, literature, composition, and history under television conditions; better in composition, English, and psychology under small-discussion type conditions.

Four studies made cross-comparisons of test scores of high, average, and low students. That is, a high group under one condition compared to a low group under another condition. The studies reported above compared similar groups under different conditions.

Williams (54-6) found that the test scores of the low group under condition V' were not significantly different from the test scores of the average group under audio-only conditions. Concerning the high group, he concludes: "Apparently television has its greatest effect on the best students."

Carpenter (57-2) in reporting the information gain for all groups as VI' over V' over I over VIII, found that low students who received the presentation electronically scored as well as average and high students who received the information by lecture with discussion permitted, or printed material.

Kanner, *et al*, (54-5) found that the test scores of four Content areas in Army Basic Training courses were approximately equal for the high group under conditions V' and I^{V}, compared to the low group under similar conditions, who had received an additional presentation of the Content by means of kinescope and were retested. That is, regardless of the original Communication conditions, low group students who received a refresher of the Content by means of kinescope did as well on a re-test of the material as the high group students did after the initial presentation.

In another study, reported by the same author (58-13), using length of presentation as a qualifying factor, low students under either condition I or V' who had received five days of instruction, scored as well as high students under condition V' who had received the same amount of material in three days.

In summary of this section, it appears that there is conflicting evidence in support of the contention that low students show greater information gain as a result of having information presented to them by means of television.

There is an indication that Content and measurement play determining roles, in the light of studies which show that all students do better under television conditions when the Content is predominantly factual.

L1.1, P2 - Experience of Instructor and Achievement

Davies, *et al*, (57-5) determined that the experience of the instructor with method of presentation, i.e., lecture, question and answer, use of visual aids, had no effect on student achievement.

Macomber and Siegel (57-11) found no significant differences in information gain among students whose receiving room instructors varied in the amount of experience teaching in conventional conditions.

Kanner, *et al*, (58-13) found that trainees under television conditions did not differ significantly in test scores when one group received presentations from an inexperienced instructor with a teleprompter, and another group was taught by an experienced lecturer.

L1.1, P4 - Sex and Information Gain

Six studies examined sex as a factor in information gain under various conditions of Communication.

Brandon (56-2) determined that there was no difference in the amount of information gain between methods due to presenting newscasts on kinescope by lecture (a), discussion (d) or interview (i), but that females scored higher in all sub-categories than did males.

Jorgenson (56-6) found no significant differences between the sexes in information gain from newscasts on kinescope.

Anderson and VanderMeer (54-2) found no differences between male and female high school students on achievement under conditions I and V', in a six-week course on the slide rule.

Champa (57-3) determined that males scored higher than females under both conditions I and V' in a ninth grade science course.

Merrill (58-19) found no differences in achievement between the sexes in one-way television only presentations concerning soil tillage and agriculture.

In a psychology of marriage course, Carpenter and Greenhill (58-5) reported no significant differences in learning between males and females in an originating room of mixed sexes, and in three separate receiving rooms of all males, all females, and mixed.

There seems to be little evidence which would indicate that one sex does better than the other due to receiving instruction under television or conventional conditions. Differences which do occur seem to be related more to the Content and other Personal Attributes.

L1.1, P6 - Auding Ability and Information Gain

Dreher and Beatty (58-7) measured the auding or listening ability of students, and then checked the high and low ability students for information gain. They found that neither high nor low auding ability affected differentially the information gain of students compared under conditions I and V' in economics and psychology courses.

L1.1, P7 - Status and Information Gain

The following studies were conducted under Communication conditions V or V'.

Merrill (58-19) examined urban, rural non-farm, and rural farm groups, and determined that there were no significant differences in information gain among the three groups. By way of illustration he pointed out that urban females learned about as well as farm males when the Content was soil tillage and agriculture.

Jorgenson (56-6) found that information gain from 12 news stories was greatest for college students, less for Air Force personnel, and least for young adults from a Community Center.

Belson (55-1) found a tendency for information gain scores to rank from highest down in the following order of occupational levels: professional, highly skilled, skilled, and moderately skilled. The Content was economic trends and national facts and figures.

Vernon (53-1) found information gain from five half-hour television talks on modern building and town planning greatest for a WEA group (women), less for sixth form grammar school girls, and least for RAF men.

Two studies checked on the prestige of the source of information in regard to information gain. Evans and Asher (58-10) found no significant differences in learning when the program was described as originating from a national television network, or from the local station.

Kumata (58-17) found no significant differences in achievement when the instructor was described as a national authority, a departmental expert, or a regular classroom teacher, under one-way television conditions.

L1.1. P9 - Level of Aspiration and Information Gain

Dreher and Beatty (58-7) examined students of high and low "need to achieve." In a psychology course low students under condition V' gained significantly more than low students under condition I. For high students, in Creative Arts and economics, individuals under condition I gained more than those under V'.

Klapper (58-13) found no significant differences in information gain of students who were rated high and low in "attention," under condition V'.

Mullin (57-13) used monetary reward to establish "motivated" and "unmotivated" groups of high school students, under condition V'k. The motivated students scored significantly higher than the unmotivated students.

This concludes the presentation of data which concern the learning of facts and information (L1.1) across the system.

Differences in Critical Thinking (L1.2)

Grouped under this heading are measures of application, comprehension, analysis, synthesis, problem-solving, complex learning, recognition of relationships, assimilation, evaluation, and other similar descriptions which have been mentioned by investigators treated in this study.

There has been considerably less experimentation with and evaluation of this aspect of learning.

Only eight studies made the distinction between information gain (L1.1) and critical thinking (L1.2) sufficiently clear to enable analysis and correlation of the data.

In simple comparisons of critical thinking ability among students under different Communication conditions, six studies reported no differences between conditions I and V', and one study found no difference between IV and V'.

Two reports indicate differences. Frank (55-4) found the increase in critical thinking greater under condition V' than under VI' for weather Content. Macomber and Siegel (57-11) found I greater than V' in an economics course.

Several of these studies analyzed the results under the Personal Attributes-intelligence (P1) category.

Macomber and Siegel (57-11) found no differences for high and low groups in Human Behavior, physiology, and Air Science, but did find that the high group (Pl.1) did better under condition I, than under V', in an economics course.

Dreher and Beatty (58-7) found no significant differences between high and low groups under conditions I and V' in psychology, basic communication, and creative arts Content. A significant difference for the high group favoring those under condition I was found in an economics course.

Carpenter and Greenhill (58-5) found no differences between high and low groups under conditions IV and V' in psychology and music appreciation, but did find a significant difference between two subgroups, both of which received information by television. One group was required to attend a problem-solving session, and the other was not. The group required to attend these sessions scored higher than the independent study group in an economics course.

Erickson and Chausow (58-9) found the high group did better under condition I, and the low group better under condition V' in a Biology course.

Klapper (58-14) found that both high and low groups did better under condition I than under condition V' in a composition course.

These results indicate that as far as gain in critical thinking is concerned, small-discussion type conditions are better for high groups (Pl.1) than are one-way television conditions. There is conflicting, and even less, data concerning low (Pl.3) students. It is interesting to note that of the five courses in which differences occurred, three of them were in economics. Also, these reports are the only ones which have presented information regarding economics at the University level.

Two studies checked on students measured by auding ability and gain in critical thinking.

Carpenter and Greenhill (58-5) and Dreher and Beatty (58-7) found no differences in groups of high (P6.1) and low (P6.3) auding ability under one-way television, large-lecture type, and small-discussion type groups.

Dreher and Beatty (58-7) also checked the gain in critical thinking of groups whose "need to achieve" was high (P9.1) and low (P9.3). In three courses, psychology, basic communication, and economics, no significant differences were found. In a course in creative arts, the group with the low need to achieve did significantly better under condition V' than did the low group under condition I.

This completes the presentation of data concerning changes in Cognitive Structure (L1): information gain and achievement (L1.1), and critical thinking (L1.2).

We turn now to other kinds of learning.

Motivation (like or dislike) (L2)

All 15 studies which examined the students' attitudes toward the Content (L2.1) found that changes took place in the positive direction, regardless of Communication conditions, Situation, or Personal Attributes.

In comparing students under different conditions, four studies found no significant differences, while two reports did state that differences had been found.

Becker, et al, (58-1, 58-2), Dreher and Beatty (58-7), and Kumata (58-15) found no differences between I, V', and VIII; I, II'o, IV, and V'; I and V'; and 1, II', and Io.

Champa (57-3) found students' attitudes toward the Content more favorable after presentation under conditions V' and Vf, than under I, in a high school science course.

Kumata (58-16) found the attitudes of students under conditions I and Io to be more positive toward the Content than those under condition II'.

Other studies touched other points in the system. In an examination of attitude changes depending upon the position of information in newscasts, Brandon (56-2) reported no significant differences between the first, middle, and last segments.

Merrill (58-19) under condition V', found no significant differences in attitude change toward the Content in comparing men and women in urban, rural non-farm, and rural farm groups. Champa (57-3) found that females made a greater shift in the positive direction under one-way television conditions than did females in small-discussion type groups, in a high school science course.

These Results indicate that students' attitudes toward the Content can be positively influenced when television is utilized, with effectiveness similar to conventional conditions.

Every study which has sampled student opinion of the Communication conditions (L2.2) found that, when given a choice between "television" and "conventional" conditions, the majority of students show an acceptance of television, but a preference for conventional.

Analysis of the responses of those who had received presentations under television conditions indicates a greater shift in the positive direction. That is, students' opinion is higher after exposure than it was before exposure to television conditions, and generally higher than those who had not been exposed at all.

Rock, et al, (52-3, 52-4), Carpenter and Greenhill (55-2, 58-5), Ambrosino, et al, (56-1), Evans (56-5), Tannenbaum (56-11), Champa (57-3), Parsons (57-14), Becker, et al, (58-2), Dreher and Beatty (58-7), Klapper (58-14), and Throop, et al, (58-23), all reported results of more favorable opinion of students after exposure to television conditions.

The distinguishing feature between the opinions of conventional and television students is that the latter form more definite opinions, and cluster at the ends of a like-dislike scale. Conventional students' opinions are not as strong and are on the dislike side of a mid-point.

Seibert (57-15, 57-16, 57-17, 58-20, 58-21) reported predominantly neutral reactions to television, with little change after exposure, but tending to negative. Herminghaus (57-8) reported negative reactions.

Macomber and Siegel (57-11) found no definite trend in student opinion at the end of one semester. At the end of a second semester of exposure to television, student opinion shifted to negative.

Dreher and Beatty (58-7) found that the students who received the presentations at home had favorable opinions of television; students who received the same television presentations in the classroom had negative reactions. Evans (56-5) stated that students had positive reactions to television at home, but disliked on-campus discussion follow-up sessions.

Four studies investigated students' opinions of television when maximum and minimum treatment was given to the presentation. Klapper (58-14), and Carpenter and Greenhill (58-5) found students overwhelmingly in favor of the maximized treatment, and preferred it to conventional instruction. Becker, et al, (58-2) reported that students favored discussion over lecture as a method of presentation.

Jorgenson (56-6), using kinescopes only reported that students preferred a newscaster alone to a highly visualized presentation of a newscast.

Vernon (53-1) found preferences from highest to lowest for (1) film clips, (2) static scenes and models, and (3) photos and pictures.

The length and time of follow-up sessions after television presentations was examined by Carpenter and Greenhill (58-5). In a class meeting three times a week, they found that students preferred a combination of two days of fifty-minute television presentations followed by a third day of one fifty-minute small-discussion type class. The alternative was three days of thirty-minute television presentations followed immediately by 15-20 minutes of discussion. Concerning the latter alternative, students expressed a preference for immediate discussion rather than independent study.

In evaluations of television with audio feedback, Carpenter and Greenhill (58-5) reported students overwhelmingly in favor of it, but less than 1% of the students actually made use of the opportunity to ask questions. Throop, et al, (58-23) indicated that television students felt reluctant to ask questions, more so than the conventional group. Hatch (57-7) reported that the two-way intercom was never used; the students preferred suggestion boxes. The Los Angeles report (58-18) stated that 32% of the students believed they were able to communicate with their instructor as well as, or better than, in a non-TV class. Sixty-eight per cent felt that electronic communication impaired interaction.

These results indicate that students who have experienced instructional television generally express more favorable attitudes toward it than do students who have not had the experience, although there is evidence to the contrary as well. The majority of students, including some who have been exposed to television, prefer conventional to television conditions.

Socialization and authoritarianism (L3)

Carpenter and Greenhill (55-2, 58-5) found no significant differences between large lecture groups and one-way television in scores on the Inventory of Beliefs, which attempts to measure students' attitudes on a liberal-authoritarian continuum.

Dreher and Beatty (58-7), in an analysis of sociometric data, found small-discussion type (I) superior to one-way television (V').

Parsons (57-14) also found that condition I was superior in creating group structure than was condition Vk.

Tamminen (57-18) found that mothers who viewed programs at home in groups showed more favorable attitudes toward parent-child relationships, than did mothers who viewed the programs alone.

Tucker, et al, (57-19) evaluated the use of television for mental therapy and reported the following results. Patients who viewed commercial television improved 5.1% more than patients who did not. Patients who viewed specially prepared mental therapy television programs improved 12.1% more than patients who did not view them. Patients who viewed the mental therapy sessions on television improved 9.4% more than patients who viewed commercial television. Patients who viewed both commercial and mental therapy television programs improved 16.2% more than patients who viewed only one or the other types of program.

These results seem to indicate that television can be an aid in the process of socialization, but that face-to-face interaction is necessary for this type of learning.

Psychomotor skills (L4)

Kanner, et al, (54-5), in two performance tests of map reading and machine gun operation, found that trainees under condition V' did significantly better than those under condition IV.

Pasewark (56-7) found that students performed better at typewriting after receiving one-way television presentations (V'), than did students under condition I.

Throop, et al, (58-23) found that students under condition I did better than those under condition II', in the operation of machinery. Students under condition II' had less access to the machinery. In the Pasewark study, all students had typewriters.

Four other studies report results in this area of learning, but each of them involved follow-up conventional conditions of some sort.

Becker, et al, (58-1) found no significant differences in speaking ability for students under conditions I, Vk, and VIII. Skaine (58-22) reported similar results for a speech course under conditions I and V'. Carpenter (58-6) reported no differences under conditions Io and II' for typing and English-speech courses.

These Results indicate that television students develop psychomotor skills as well as conventionally taught students.

Learning versus previous learning (L, Lp)

This category refers to reports which compared the Results from the experiment, to Results obtained from previous semesters when experimentation was not taking place.

Englehart, et al, (58-8), Evans, et al, (55-3), and Stromberg (52-5) compared the learning of facts and information (L1.1) under condition V', with the learning of students taught conventionally in prior semesters. There were no significant differences.

Becker, et al, (58-2) and Throop, et al, (58-23) found that all students under all Communication conditions in their experiments made greater information gains (L1.1) than did students in prior semesters.

Carpenter and Greenhill (58-5) found that students who received maximized treatment of Content under both conditions IV and V' and had no textbooks, did as well as students in previous semesters with textbooks.

Champa (57-3) found that favorable attitudes toward the Content increased more under conditions V' and Vf than they did under condition I in the experiment, and that all these students made greater gains in this area of learning (L2.1) than did students from previous semesters. Erickson and Chausow (58-9) found that although statistically significant development toward the goal of critical thinking (Ll.2) was achieved in a Social Science course, it was less than that achieved in several experimental discussion classes a few years earlier.

These results suggest the presence of the Hawthorne effect, or the possibility that presentations of facts and information, both for conventional and television conditions, were better organized and thus more effective.

Learning and retention (Lr)

Except in rare cases, the retention score was lower than the original score. The results here are treated in the same manner as were those for L+. That is, the assumption is that there was a loss, unless otherwise specified.

A. Original differences, which remained.

Kanner, et al, (54-5) found that in three tests of information gain (Ll.1) where there had been differences favoring television conditions, the television students maintained this superiority on the retention test, 30 days later.

Paul and Ogilvie (57-7) report similar results after five months in a follow-up study of the Williams (54-6) report.

Kanner, et al, (54-5) also found four such cases for low aptitude trainees.

Parsons (57-14) found that differences in socialization originally favoring I, remained the same on the retention test four months later.

Mullin (57-12), who found differences in information gain due to high and low motivation, reported that these differences still favored the highly motivated on the retention test, 14 days later.

Kanner, et al, (58-13) reported that differences, due to variations in the length of time of presentation, which appeared on the initial test, remained the same on the retention test given after an interval of 30 days.

B. Original differences, became non-significant.

The Los Angeles study (58-18), which reported significant differences favoring I over II' on the original test, found no significant differences on the retention tests, which varied from seven to 35 days later.

Benschoter and Charles (57-1) in a follow-up of Husband's (54-4) study, found that differences which favored television no longer existed on the retention test, three years later.

Boone (54-3), who had found significant differences favoring both television and conventional conditions in the original test, found they had disappeared on the retention test.

Kanner, et al, (54-5) found that four tests which had favored television originally showed no significant differences on the retention test for low aptitude students.

Ulrich (55-9), who found differences favoring visual aids over no visual aids, stated that these differences no longer existed on the retention test after 30 days had passed.

C. No significant differences originally, no change.

Mullin (57-12) who reported no significant differences between at home and in classroom students on the original test, found the same results on the retention test.

Carpenter and Greenhill (58-5) found no significant differences originally, or on a retention test seven months later. Kanner, et al, (54-5) found ten such cases of equivalent loss for all trainees, and six for men with low aptitude. Kanner, et al, (58-13) also found the loss consistent from original to retention test whether the original instruction was live or kinescope, from an experienced or inexperienced instructor.

D. No significant differences originally, appeared on retention test.

Anderson and VanderMeer (54-2) found no significant differences originally, but found that students under condition I retained more than those who had been under V'. Kanner, et al, (54-5) found one test where there had been no significant difference originally, but which favored television on the retention test. Benschoter and Charles (57-1) found that low scoring students had lost less than high scoring students after three years, although there were no differences due to Communication conditions. He also found that students under condition I, who had taken three or more additional courses in the same area (psychology), scored higher on the retention test than did students who had taken an additional two courses or less. There was no significant difference in this respect for students who had received instruction under television conditions.

E. Other comparisons.

Bennett (58-3) analyzed the achievement of students who had received instruction under conditions I and V' in one semester, with their achievement at the end of the following semester, during which all students received instruction under condition I. The Content was Accounting I and II, and formed a natural sequence which could serve to check deficiencies, if any, attributable to the Communication conditions in the first semester. There were no significant differences in information gain of students under V' and I in the first semester, and no differences in the second semester when all students were under condition I.

Kanner, et al, (54-5) added a further dimension to the comparison of original and retention test scores by utilizing kinescopes for refresher purposes. He found that in four tests, trainees given this refresher, who had received original instruction under either conditions IV or V', scored significantly higher than their original scores. These, in turn, were significantly higher than retention scores of trainees who did not have the kinescope refresher. The same results were obtained for low aptitude trainees. In one subject, Military Time, the refresher scores were higher than the retention scores, which were higher than the original scores. Kanner attributes this to the fact that trainees were continually exposed to military time, which produced out of class learning.

In four comparisons with high and low trainees, Kanner found that low trainees with kinescope refresher obtained test scores not significantly different from the original test scores of high trainees without the refresher, regardless of the original Communication conditions.

The Results of this section on retention indicate no consistent pattern, other than that there is a loss as measured by test socres, unless some method of refreshing or using the information is employed. Some studies indicate that differences which appeared on original tests remained on the retention test. Other comparisons, which originally favored either television or conventional, were not significant at a later date. Still other studies show that non-significant differences which were obtained originally did not change.

The most interesting Results are those which indicate that although there were no significant differences originally, some did appear on the retention test. These differences favor both one-way television and small-discussion type conditions, as well as low scoring students.

Relations between elements and Learning (L, S, CP, P)

Seven studies examined relationships between the different kinds of Learning. Jorgenson (56-6), Herminghaus (57-8), Macomber and Siegel (57-11), Carpenter and Greenhill (58-5), and Seibert (58-21) all found that there was no significant relationship between information gain and attitude toward the Communication conditions (L1.1/L2.2#). Brandon (56-2) and Tannenbaum (56-11) found a positive, but low, correlation between attitude toward the Communication conditions and information gain (L1.1/L2.2+). Carpenter and Greenhill (58-5) also reported a positive correlation between information gain and changes in opinions and beliefs (L1.1/L3+). That is, the better achievers were also less authoritarian than the poorer achievers. Macomber and Siegel (57-11) also report a positive correlation between student's opinions of the Communication conditions and their opinions of the instructor (L2.2/L2.4+).

Earlier, gross opinions of television were reported. Studies which gave the student an opportunity to choose between a greater number of alternatives than simply "television" or "conventional" provide more meaningful information about the relationships of the elements in the system.

The Los Angeles report (58-18) introduced the element of class size, and found that students preferred small television receiving rooms to large lecture halls.

Carpenter and Greenhill (58-5) indicate that there is a relationship between class size, position, and preference for small television receiving rooms. In a General Chemistry course, students received instruction in a large lecture hall and in small television receiving rooms for different periods of time. At the end of the experience with both conditions, the students had to make a behavioral choice between the two situations. Students from the sides and rear of the lecture hall chose small television receiving rooms. Similar studies were made in psychology, political science, and business law. In the first two courses, a substantial majority preferred one-way television to large-lecture hall. In business law and political science, the number of students making the behavioral choice (physical action and committment) was greater than the number of students who had expressed a preference for television on a written questionnaire.

Klapper (58-14) reported a relationship between preference for television and the instructor. Students preferred to receive instruction by means of television from a "known" or experienced instructor, rather than have an "unknown" or inexperienced instructor in a small-discussion type class.

Hatch (57-7) reported the same opinion from students, as did Carpenter and Greenhill (55-2, 58-5), who also added that the time of day the course was offered was more important than the Communication conditions, in the opinion of the students. In a chemistry course, all complaints about difficulty in note-taking ceased after mimeographed lecture notes were furnished to students.

Bennett (58-4) combined class size, the instructor, the Communication conditions (I and V'), and the option of having mimeographed notes furnished. Opinions of students who chose from combinations of these elements were as follows, in order of preference: (1) type I, experienced instructor, 25 students, notes furnished; (2) type I, experienced instructor, 25 students, no notes; (3) type V', experienced instructor, 25 students, notes furnished; (4) type V', experienced instructor, 25 students, no notes; (5) type I, experienced instructor, 50 students, notes furnished; (6) type I, inexperienced instructor, 25 students, notes furnished. The remaining 12 preferences indicate further variations. Television is not mentioned again. Notes appear to be a relatively minor concern, students tend to prefer a larger class to an inexperienced instructor.

Examining another element, the receiving room instructor, the Macomber and Siegel (57-11) and Los Angeles (58-18) reports suggest that student opinion may be influenced, positively or negatively, by the attitude of this individual toward the utilization of television in the teaching-learning process.

Studies concerning the instructor, Communication conditions, and information gain, indicate that the instructor is a much more reliable predictor of the information gain of students than are the Communication conditions. Klapper (58-14) found the instructor to be more important than conditions I and V'; Macomber and Siegel (57-11) report similar conclusions under conditions I, IV, and V'; the Los Angeles report (58-18) states that this was the case under conditions I, Io, and II'; and Becker, et al, (58-1) indicate the same thing under conditions I and Vk, for average and below students. For above average students there is little, if any, relationship between information gain, the instructor, and the Communication conditions.

The Personal Attributes of the students were examined for meaningful relationships. Ambrosino, et al, (56-1) indicate that the intelligence of the student is a greater predictor of information gain than are the Communication conditions. Macomber and Siegel (57-11) state that there is no significant relationship between intelligence and students' attitudes toward Communication conditions.

Klapper (58-14) reports an interesting relationship between attention and initial knowledge in one-way television conditions. There is a positive relationship between high initial knowledge and low overt attention, and a positive correlation between low initial knowledge and high overt attention.

Three studies checked to see if there was any relationship between the students' not completing the course and the fact that television was being used. Bennett (58-3), Kanner, et al, (58-13), and the Los Angeles report (58-18) all indicated that there was no relationship between failure to complete the course and the fact that Content was being presented by television.

The Results from reports cited in this section seem to indicate that student attitudes "toward television" are more accurately described as attitudes toward other elements involved in the total teaching-learning process.

There seems to be little relationship between information gain and students' attitudes "toward television."

The instructor is by far a more reliable predictor of information gain and students' attitudes, than is a particular Communication condition.

Small classes, in numbers of students, are more important to students than the Communication conditions.

An experienced instructor is much more important, in the opinion of students, than are the Communication conditions.

The failure of students to complete course work is not related to the Communication conditions.

SUMMARY

This chapter has presented available data from studies, which were recorded on the Classification System. The entries were correlated here to illustrate (1) that Learning did take place, (2) the differences in amount and kind of Learning, and (3) relationships which exist between elements of the system.

CHAPTER IV

CONCLUSIONS AND DISCUSSION

The purpose of this study was to analyze and correlate television research in the teaching-learning process by means of a Classification System, (1) to organize the information so that it would be readily and meaningfully available, (2) to identify what is now known, and (3) to determine what is not known and suggest directions for future research.

The results of this undertaking are as follows:

1. Students, who received Content by means of television, evidenced Learning in every type examined: 1) Cognitive structure (achievement and critical thinking), 2) Motivation (like or dislike), 3) Group belongingness (socialization, authoritarianism), and 4) Psychomotor skills.

2. The overwhelming majority (almost 90%) of gross comparisons between television and conventional Communication conditions show no substantial differences in achievement or information gain.

3. The relatively few comparisons which have indicated differences in achievement and information gain show that: 1) small-discussion type classes are slightly favored over one-way television, 2) one-way television is slightly favored over large-lecture type classes, 3) small-discussion type classes are greatly favored over television with audio feedback, 4) small-discussion type originating room is about equal to television with audio feedback, 5) small-discussion type is

favored over small-discussion type originating room, and 6) one-way television is slightly favored over printed material.

4. There is contradictory and insufficient evidence as to the relative effectiveness of television and radio.

5. Kinescopes and films are about as effective as live presentations.

6. The Content of the studies indicating differences in information gain show television favoring the sciences, and conventional favoring English, speech, and communication.

7. For the presentation of information, the straight talk or lecture produces greater information gain than does a discussion, in which students do not actively participate but merely observe.

8. An equivalent or greater gain in information can be effected in a shorter period of time when the Content is presented by means of television, compared to conventional conditions.

9. When immediate post-tests are administered, students generally exhibit the same or greater information gain under television conditions as they do under conventional conditions.

10. No definite conclusions can be reached as to which portion of a television presentation produces the greatest achievement: first, middle, or last.

11. There is no specific guide as to how much information can be contained in a television presentation and learned by students.

12. There are no significant differences in information gain attributable to the size of the receiving room, when the total of students per receiver approximately equals in number the screen size in inches.

13. There are no significant differences in achievement among students placed in the front, middle, or rear of a television receiving room, when the minimum distance from the screen is approximately twice screen size, and the maximum distance is approximately screen size expressed in feet.

14. Television students at home do as well as or better than students in conventional classrooms.

15. There is insufficient data on information gain concerning the lack of color with television.

16. There is no significant difference in students' attendance patterns between conventional and television classroom conditions.

17. Greater achievement is shown on information tests by students who receive "simple" television presentations, as compared to "highly visualized" presentations.

18. When both television and conventional presentations are "maximized," there is an indication that television produces greater information gain, but for the most part there are no significant differences.

19. There is strong evidence that tests measure principally verbal Content, and that visual tests are needed to measure visual Content.

20. There is a suggestion that visual material attracts the attention of the student to such an extent that the learning of the verbal material is interfered with.

21. No significant differences in achievement resulted from the amount of supervision in the receiving room, from full-time to none at all.

22. No significant differences in achievement resulted from the status of full-time supervisory personnel in the receiving room, from peer to adult authority.

23. There is conflicting information regarding the high and low intelligence groups, as to which fares better under certain Communication conditions.

24. Low group students, who are given more time for presentation, score as well as high groups given a shorter television presentation.

25. Low group students, who are given a refresher of the Content, score as well as high groups which do not receive a refresher.

26. No significant differences in achievement were produced in television students due to varying experience of the instructor in conventional conditions.

27. No significant differences in information gain resulted from varying the prestige of the information source.

28. No significant differences were evidenced between males and females due to receiving information under television or conventional conditions.

29. Auding ability produced no significant differences in achievement under conventional or television conditions.

30. Groups of high socioeconomic status learned more than low groups under television conditions.

31. There is significantly greater gain in critical thinking and problem-solving under conventional conditions than there is under one-way television, particularly for high intelligence students.

32. Economics Content courses showed greater gain in critical

thinking and problem-solving among students in conventional conditions. Only three studies presented economics Content, all three reported significant differences.

33. Students' concept of Content can be changed through television presentation.

34. Face-to-face interaction produces more positive changes in group structure, attitudes, and socialization than does one-way television, but television can stimulate and enhance the process.

35. Television students develop psychomotor skills as well as conventionally taught students, providing that they have equal access to any equipment which is to be manipulated.

36. Students under all Communication conditions in the experiments generally did better than students from previous semesters.

37. There is no consistent evidence on retention tests which points to a superiority of conventional or television conditions over the other.

38. In gross comparisons between "television" and "conventional" conditions, the majority of students prefer conventional conditions.

39. Most studies indicate that students' opinions of television became more favorable after exposure than they were before exposure.

40. There is a positive relationship between preference and the Communication conditions to which students were exposed.

41. There is little relationship between students' information gain, and their attitudes toward the Communication conditions.

42. Students generally prefer "highly visualized" rather than "simple" television presentations.

43. Students express a preference for talk-back facilities in television conditions, even though a very small percentage of the students use them to ask questions or communicate with the instructor.

44. Students prefer separate periods of television presentations and conventional discussion conditions, rather than splitting a single period for a short television presentation and a short discussion.

45. In the opinion of students, small classes are more important than the Communication conditions, i.e., they prefer small one-way television receiving rooms to large lecture halls.

46. Students prefer to have lecture notes provided under all Communication conditions, although this is of relatively minor importance compared to the instructor and class size.

47. In the opinion of students, "known" or experienced instructors are more important than the Communication conditions, i.e., they would rather receive television presentations from an experienced instructor, than have an inexperienced instructor in a conventional classroom.

48. There is a positive relationship between students' opinions of the instructor and their opinions of the Communication conditions.

49. Instructors are greater indices of student Learning than are the Communication conditions.

50. The intelligence of the student is a greater predictor of information gain than are the Communication conditions.

51. There appears to be a positive relationship between initial knowledge and overt attention. Students with high initial knowledge evidence low overt attention; students with low initial knowledge

show high overt attention.

52. There is no relationship between students' failure to complete a course and the Communication conditions, i.e., television does not cause a greater "drop-out" rate.

53. Students' attitudes toward "television" are more accurately described as attitudes towards other elements involved in the teaching-learning process, e.g., the instructor, the Situation, and the Content.

OBSERVATIONS AND DIRECTIONS FOR FUTURE RESEARCH

If the results of experimentation with television in the teaching-learning process are to provide information which can be used in making decisions on educational change or no change, then greater care must be taken to detail and define the elements involved.

Although some conclusive information is available, much remains to be determined. Three central problems emerge from this study, all of which are intimately related to each other and to numerous specific issues regarding instructional television.

First, there is a need for an accepted system of correlating results based on common definitions and explicit terminology. Second, there is a need for more accurate and sensitive instruments and criteria for measuring learning. Third, there is a need for greater attention to and evaluation of learning from visual material.

Proper understanding of the television is essential to an accurate appraisal and utilization of it in the teaching-learning process. There still seem to be substantial differences among investigators as to just what television is. The terms "method," "mode," "means," "media," and "technique," were all used in various studies to describe television presentations. The conflict here lies not so much with principle, but with definition and interpretation, which makes generalizing from and integration of results difficult.

Analysis of the data indicates that television requires two basic understandings. First, it is an electronic means of transmitting verbal and visual symbols; and second, it offers certain potentialities and limitations which increase or reduce the effectiveness of the presentation. Television does not create or present Content. It is a means of transportation, and as such, there are some things which it cannot carry. It remains to be determined what it can carry most effectively.

The accuracy and adequacy of experimental results are dependent upon the instruments and criteria used to measure learning. The distinction must be made between learning by the student, and the evaluation of it by someone else. Educators accomplish this evaluation in many ways, not just by formal paper and pencil tests. That is, when the instructor and student are in each others physical presence, there can be almost minute-by-minute evaluation by the instructor of how well the Content is being grasped by the student. This is in addition to specific periods of evaluation, which are accomplished through some performance by the student.

The introduction of one-way television into this process imposes limitations, particularly on the immediate aspect of evaluation. Learning can take place as soon as the Content is presented; evaluation must be delayed.

On the basis of these delayed examinations, no significant differences in information gain were found in almost 90% of the comparisons made between conventional and television presentations. There is no assurance, however, that these delayed examinations measured only and all learning from "television" or "conventional" conditions. It is possible that the students either learned from other sources, or lost control of some of the information in the course of time. When measurement was made immediately after presentation, differences appeared generally favoring television conditions over conventional.

Most of the studies have operated under the assumption that learning from conventional conditions is the proper standard for comparison. Some investigators checked the results obtained from all experimental groups, and found that they were better than those of students from previous semesters. This may simply indicate a novelty effect, or it may mean that improvements can be made in conventional instruction. In any event, there is a question as to whether or not it is a sufficient standard by which to evaluate television. A more adequate standard, and goal, would seem to be the improvement of the effectiveness and efficiency of the teaching-learning process, no matter what the Communication conditions. To accomplish this, more sensitive and accurate means of measurement are a necessity.

The introduction of television into the teaching-learning process also served to bring to light the problem of measuring learning from verbal symbols and visual material. The advent of instructional television has resulted in an increase in the use of visual aids, such as physical objects, graphics, and other illustrative material. For years, however, tests have been constructed to measure the verbal symbols presented. This was a result, of course, of the fact that most of the

Content was presented verbally, without visual aids. It is only to state the obvious to say that when verbal tests are used to measure verbal symbols _and_ visual material, learning from the verbal symbols is greater.

There is an implication that the visual material presented can be learned. Conversely, the visual materials may be a detriment to the learning of verbal symbols. That is, if the verbal symbols contain the bulk of the information to be learned, then the visual material may interfere with or detract from the learning of the verbal symbols by disproportionately attracting the students' attention.

Some excellent pioneering work has been done in this area by Barrow and Westley,[1] Irwin and Aronson,[2] and Kumata.[3] No definite conclusions can be reached as yet, however, concerning visual material, other than it can be learned, and it can interfere with learning from verbal symbols.

These are the three major areas in which work needs to be done in regard to the utilization of television in the teaching-learning process.

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[1] Lionel C. Barrow, Jr., and Bruce H. Westley. _Television Effects: A Summary of the Literature and Proposed General Theory_, Research Bulletin No. 9 (Madison, Wisconsin: University of Wisconsin Television Laboratory), May 26, 1958.

[2] John V. Irwin and Arnold E. Aronson. _Television Teaching, Conventional Lecture versus Highly Visualized Film Presentation_, Research Bulletin No. 11 (Madison, Wisconsin: University of Wisconsin Television Laboratory), December 15, 1958.

[3] Hideya Kumata. _Teaching Advertising by Television--Study II_, Communications Research Center, Michigan State University, (no date) 1958? (ditto).

We turn now to a brief look at specific elements included in the Classification System.

CONTENT

Although there are indications that television can be more effective in the presentation of science Content, and conventional conditions seem to be better in the humanities for information gain, it is premature to make any broad conclusion concerning particular Content for television, until clarifications are made in regard to the problems mentioned above.

COMMUNICATION POTENTIAL

Distinctions must be made between one-way television, television with audio feedback, television originating rooms, and even two-way television. These conditions all offer different potential for communication, and should not be lumped together as simply "television." The results reported earlier illustrate the fallaciousness of making broad generalizations concerning instructional television.

There is evidence to indicate that class size is an important factor, and may explain some of the differences. Other differences may be attributable to interference caused by the sheer mechanics of television. That is, in television with audio feedback and originating room conditions, students are made increasingly aware of the physical equipment necessary for electronic transmission. In some cases they may even be called upon to manipulate the equipment, e.g., microphones. Perhaps there is a similar problem here as there was discussed regarding verbal symbols and visual material. In this instance, the students may become so involved with and distracted by the operation of equipment that they cannot give complete attention to the Content. This merits further investigation.

Another type of experimentation which ought to be undertaken is that of holding a particular Communication condition constant, and examining other elements within the Classification System. Experimentation with conventional conditions shows a validity for lecture, discussion, question and answer, and other methods, depending upon the Situation, Content, students, instructor, and type of Learning. Similar studies should be made utilizing various types of television conditions.

SITUATION

The only element in the Situation which seems to have been adequately investigated is that of the number of students per receiver under one-way television conditions, insofar as information gain and psychomotor skills are concerned. There is still a need for investigation concerning motivation and socialization when viewing is done alone or in various sized groups.

All of the other elements in the Situation need more specific attention, particularly the frequency, length and time of presentations, optimum viewing conditions, and color.

PERSONAL ATTRIBUTES

There is virtually no conclusive evidence about either the instructor or the student, which isolates certain types of individuals as more receptive to instructional television.

In regard to the attributes of students, the question of whether or not television favors a particular intelligence level is still unanswered.

The characteristics for a television instructor are inadequately defined. Studies have shown no significant differences in student information gain when a television presentation was made by experienced or inexperienced instructors. The criterion, however, was experience in a conventional classroom. It is possible that the television teaching situation is so different that the experienced instructor must "unlearn" a great deal in the way of cues and responses he is accustomed to receiving from students. If this is true, his effectiveness may be the same as that of an individual who has no experience at all in either conventional or television conditions.

Also, there have been no significant differences in achievement because of high or low prestige of the information source. This could be interpreted to mean that there is no correlation between the respect for an individual, ethos, and his ability to effect learning. Much more work needs to be done with the Personal Attributes of individuals in the teaching-learning process.

LEARNING

More than enough gross comparisons between Communication conditions and information gain have been made. This aspect of Learning warrants additional study only if more specific elements in the Classification System are treated, particularly with various types of television conditions. The other types of Learning also need more investigation.

Perhaps the greatest emphasis should be given to examining the relationships between students' preferences and Learning. It would seem that there ought to be a greater correlation than has been evidenced to date.

Examine, for a moment, the comparisons which did show significant differences in achievement. Information gain is greater in small-discussion type classes than it is under one-way television conditions. Information gain is greater under one-way television than it is in large lectures. In the opinion of the students, small class size is more important than conventional or television Communication conditions. There seems to be a relationship here.

Students prefer having talk-back facilities available, yet groups which had them showed no difference or fared poorer than conventional students. This may be related to the interference of physical equipment, which was discussed earlier.

Studies have shown consistently that students prefer "highly visualized" over "simple" television presentations, yet the results in information gain do not substantiate this preference. If anything, they contradict it. This relates to the central problems mentioned previously of visual material, verbal symbols, measurement, and more explicit terminology.

SUMMARY

In summary, it can be said that great strides have been made in evaluating the use of instructional television. Yet, the surface has been hardly scratched. A tremendous job lies ahead, and concentrated effort is needed to determine how to improve the effectiveness and efficiency of the teaching-learning process.

It is hoped that this study, by identifying what is and what is not known, and making it meaningfully available, has helped to both eliminate unnecessary duplication of effort and indicate directions for future research.

APPENDICES

APPENDIX A - CLASSIFICATION SYSTEM

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
Fritz	Electronics (M)	V'-I		1.1	1.1	L1.1:CP#
52-1		I		1.3		L1.1, P1.1:CP#
						L1.,P1.3:CP#
Jackson	Materials (M)	VOk,Rf			1.1	L1.1: Ok,Rk>Rf
52-2		VOf,Rf				L1.1: Of,Rk>Rf
		VOk,Rk	4.4			L1.1: Of,Rk>Rf,S4.4
		VOf,Rk	4.5			L1.1:(Of,Rk,S4.5 # Rk,S4.4)
Rock	Pilot Refresh,	II'	1.1(t)		1.1	L1.1: II'≥IV 80%
52-3	Basic Trng (M)	Vk				L1.1: Vk ≥IV 75%
		IV				L1.1: II'≥Vk 84%
					2.2	L2.2+
Rock	Army Operations (M)	V'	1.1(t)	7.1 (Off)	1.1	L1.1:P7.1>P7.2
52-4				7.2 (EM)	1.1r7-35	L1.1r:#
					2.2	L2.2 +
Stromberg	Introductory	V'-VIIh	3.03-3.01		1.1	L1.1+
52-5	Psychology (U)				1.1p	L1.1>L1.1p
Vernon	Information:	V'Od	6.1 film	7.1 WEA	1.1	L1.1:P7.1>7.2>7.3
53-1	Modern Bldg.	V'Oa	6.2 static	7.2 6th form girls	1.1	L1.1:a>d
	Politics		6.3 photos			
	Effects of Heat on Body				2.3	L2.3:S6.1>6.2>6.3
				7.3 RAF		
	.1 beginning				1.1	L1.1:C.1>C.2
	.2 end of program (m)					

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
Allen 54-1	Food Service Activities (M)	I V'		1.1 1.3	1.1	L1.1:CP#
Anderson 54-2	Slide Rule (10)	IV V'		1.1, 1.3 4M, 4F	1.1	L1.1:CP# L1.1,P1.1:CP# L1.1,P1.3:CP# L1.1,P4:CP#
Boone 54-3	Circuits, (M) 2)Wave Shaping 1)Electrical	IV ↔ V' V' ↔ IV	1.1(t)		1.1 1.1r	L1.1,C1:V'>IV L1.1r,C1:CP# L1.1,C2:IV>V' L1.1r,C2:CP#
Husband 54-4	General (U) Psychology	V' Io ↔ V' Vk	3.03		1.1	L1.1:Vk>V'>Io↔V'
Kanner 54-5	Basic Training 1)M1 Functioning 2)Phonetic Alphabet 3)Military Time 4)Military Justice 5)Mines and Booby Traps 6)Map Reading 1 7)Map Reading 2 8)Map Reading 3 9)Map Reading 4 10)Map Reading 6 11)Map Reading 7 (written)	IV V'	1.1(t)		1.1 4 1.1r$_{30}$	L1.1,C1:V'>IV L1.1,C2:V'>IV L1.1,C3:CP# L1.1,C4:CP# L1.1,C5:CP# L1.1,C6:CP# L1.1,C7:V'>IV L1.1,C8:CP# L1.1,C9:CP# L1.1,C10:CP# L1.1,C11:CP# L4,C12:V'>IV L1.1,C13:CP# L1.1,C14:CP# L1.1,C15:CP#

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
Kanner	12)Map Reading 7	IV	1.1(t)	1.1	1.1	L1.1,C16:CP#
54-5	(performance)	V'		1.3	4	L4,C17:V'>IV
(cont)	13)Map Reading 8				1.1r$_{30}$	
	14)Squad Tactics					Lr,C1:V'>IV
	15)Defense					Lr,C2:V'>IV
	Against Air					Lr,C3:V'>IV
	and Armor					Lr,C4:CP#
	16)Machine Gun					Lr,C5:CP#
	written					Lr,C6:CP#
	17)Machine Gun					Lr,C7:V'>IV
	performance					Lr,C8:CP#
						Lr,C9:CP#
	(M)					Lr,C10:CP#
						Lr,C11:CP#
						Lr,C13:CP#
						Lr,C14:CP#
						Lr,C15:CP#
						L1.1,P1.3,C1:V'>IV
						C2:V'>IV
						C3:V'>IV
						C4:CP#
						C5:CP#
						C6:V'>IV
						C7:V'>IV
						C8:V'>IV
						C9:CP#
						C10:CP#
						C11:CP#
						L4 C12:V'>IV
						L1.1 C13:CP#
						C14:V'>IV
						C15:V'>IV

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
Kanner 54-5 (cont)	(cont)	IV V'	1.1(t)	1.1 1.3	1.1 4 $1.1r_{30}$	C16:CP# L4 C17:V'>IV Lr,Pl.3,C1:V'>IV C2:CP# C3:V'>IV C4:CP# C5:CP# C6:CP# C7:V'>IV C8:CP# C9:CP# C10:CP# C11:CP# C13:CP# C14:V'>IV C15:CP#
		IV V'k	1.1(t)		1.1	L1.1,C1:CP# C2:V'k>IV C3:CP# C5:CP# C9:CP# C14:CP# C15:CP#
		(IV¢V'p) Vkr*	1.1(r)		$1.1r_{30}$	Lr,C2:Vkr>L1.1>1.1r Lr,C3:Vkr>L1.1r>1.1 Lr,C9:Vkr>L1.1>1.1r Lr,C14:Vkr>L1.1>1.1r Lr,C15:Vkr>L1.1>1.1r

*kinescope
refresher

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
Kanner 54-5 (cont)	(cont)	(IV,V'p) Vkr*	1.1(t)	1.1 1.3	1.1 $1.1r_{30}$	Lr,P1.3,C2:Vkr>1.1>1.1r Lr, " ,C3:Vkr>1.1r>1.1 " " C9:Vkr>1.1>1.1r " " C14: "> " > " " " C15: "> " > "
						C2:(L1.1,P1.1,CP# L1.1r,P1.3,Vkr) C3:(" ") C14:(" ") C15:(" ")
	Summary, conclusions	*kinescope refresher				L4:V'+ L1.1:V'+
Williams 54-6	Thinking (U) Through Language	IVo V' VI' VIII	1.1(t)	1.1 1.2 1.3	1.1	L1.1:V'>VI'>VIII L1.1,P1:V'>VI'>VIII L1.1:(P1.3,V')#(P1.2,VI')

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
Belson 55-1	Facts and Figures (m)	Vk	1.1(t)	7.1 professional 7.2 highly skilled 7.3 skilled 7.4 moderately skilled	1.1	L1.1:P7.1>7.2>7.3>7.4
Carpenter and Greenhill 55-2	1) General (U) Chemistry 2) General Psychology 3) Psychology of Marriage	IV IVo V'			1.1 2.1 2.2 3	L1.1:CP# L2.1,C1:IV>V' L2.2,C1:IV>V' L3:CP# L2.2:PO>CP
Evans 55-3	1) Elementary Psychology 2) Elementary Biology (U)	(IVp) V'-VIII V'-I			1.1	L1.1:CP#
Frank 55-4	Weather Briefings (M)	V' VI'	1.1(t)		1.1 1.2	L1.1:V'>VI' L1.2:V'>VI'
Hard and Watson 55-5	Science, Horticulture (U) 1)15 terms 2)20 terms 3)25 terms	Vk	1.1(t) 15 min. 19 min. 25 min.		1.1	L1.1:C3>C2>C1 L1.1:C# %

Investigator & Number	Content & Level	CP	SITUATION	Pers. Attr.	Learning	Results
Hurst 55-6 (q.v.52-2)	1)Materials I (M) 2)Materials II	VOk,Rf VOf,Rf VOk,Rk VOf,Rk			1.1	L1.1,C1:CP# L1.1,C2:f>k
Paul and Ogilvie 55-7 (q.v.54-6)	Thinking (U) Through Language	IVo V' VI' VIII			1.1r$_{150}$	L1.1r:V'>VI'>VIII L1.1>L1.1r:CP#
Stanley 55-8	Art (ES) Language Arts Music Social Studies Natural Science Safety Educ. Industrial Arts	V'			1.1 2.1	L1.1+ L2.1+
Ulrich 55-9	Food Resources of Africa (8)	Vk	6.1 visual aids lashed on 6.2 visual aids handled by speaker 6.3 speaker only 1.1(t)		1.1 1.1r$_{30}$	L1.1:S6.1#6.2>6.3 L1.1r:S6#

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
Ambrosino 56-1	Mathematics(11) Chemistry (HS) English (10) Composition	Io II'		1	1.1	L1.1:CP# L2.2:CP+ L1.1:P1>CP
Brandon 56-2	Newscasts (m) 1)first 10 min. 2)middle " " 3) last " "	Vka Vkd Vki	1.1(t)	4M 4F	1.1 2.1 2.2	L1.1:CP# L1.1,CP:P4F>P4M L1.1:C2>C3>C1 L2.1:C# L2.2,P4:CP# L2.2:d&i>a L1.1/L2.2+ (low)
Cincinnati Public Schls 56-3	Chemistry (HS) 1)Anderson Chem. Test 2)Local-carbon 3)Local-nitrogen, Organic	I V'			1.1	L1.1,C1:CP# L1.1,C2:CP# L1.1,C3:V'>I
Desiderato 56-4	Radio Repair (M)	IV V'	1.1(t) 1.02 1.03		1.1	L1.1:(IV,S1.03 # V',S1.02) L1.1:(V',S1.03 > IV,S1.03)
Evans 56-5	Elementary (U) Psychology	V'-Idh	3.03-3.01		2.2	L2.2,V'+ L2.2,Idh-

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
Jorgensen 56-6	News (m) 1)first four stories 2)middle four 3)last four	Vk	6.1 films 6.2 pictures 6.3 Speaker only 1.1(t)	1 3 4 7.01 college 7.02 young adults community center 7.03 Air Force personnel	1.1 2.2, 2.3	L1.1:S6# L1.1:P7.01>7.03>7.02 L1.1:C3>C2>C1 L2.2:P7# L2.2:P1# L2.2:P3# L2.2:P4# L2.3:S6.3>6.2>6.1 L1.1/P3# L1.1/P4# L1.1/L2.2#
Pasewark 56-7	Beginning (U) Typewriting	I V'			1.1 1.2 4	L1.1:V'>I L1.2:CP# L4:V'>I
Pollock 56-8	1)Composition 2)Literature of England (U)	I V'		1.1 1.2 1.3	1.1	L1.1:CP# L1.1,P1.1:CP# L1.1,P1.2,1.3,C1:I>V' L1.1,P1.2,1.3,C2:V'>I
Schlaak 56-9	Art (HS) Science (HS)	V'			2.1	L2.1+
Tannenbaum 56-10	Periodontics (G)	IV V' VIII Vk Vf*	1.73 1.73 1.73 1.16 1.73		1.1	L1.1:Vk>V'>IV L1.1:Vk>Vf#VIII L1.1:V'>VIII L1.1:V'#Vf L1.1:IV#VIII

*film strip

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
Tannenbaum 56-11	Basic (&) Physiology	IVo V'	3.1, 3.3		1.1 2.2	L1.1:V'>IVo L1.1,IVo:S3# L1.1/L2.2+(low)
Willis 56-12	Algebra (HS) Physics (HS)	I V'			1.1	L1.1:CP#
Benschoter and Charles 57-1 (q.v.54-4)	Psychology of Adjustment (U)	V' Io↔V' Vk Ip		2.1 (3 or more courses) 2.2 (2 or less courses) 1.1, 1.2, 1.3	1.1r$_{1045}$	L1.1r:CP# L1.1r:P1.3>1.1&1.2* L1.1r:P2.1>P2.2, (Io) L1.1r:P2.1#P2.2 (V')
Carpenter 57-2	Thinking (U) Through Language	I V' VI' VIII	6.1,1.1(t)	1.1 1.2 1.3	1.1	L1.1:VI'>V'>I>VIII L1.1,P1.1:VI'>V'>I>VIII L1.1,P1.2:VI'>VI>I>VIII L1.1,P1.3:VI'>V'>I>VIII
Champa 57-3	Science (9)	I V' Ip		4M 4F	1.1 2.1 2.2	L1.1:Vf>V'>I L1.1,CP:P4M>P4F L2.1:Vf&V'>I>L2.1p L2.1,P4F:Vf>I L2.2+

*"The fact that subjects with lower original scores lost less than original high scorers contradicts the principle that amount of retention is positively related to amount of learning."

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
Connecticut State Dept. of Education 57-4	"Asia in Ferment" (HS)	V' V'-I		1.1 1.2 1.3	1.1 2.1	L1.1:V'-I>V' L1.1,P1:CP# L2.1:CP#
Davies 57-5	Introductory Sociology (F)	I I II'q	6.1 6.3 5.4 set time 5.5 any time 5.6 none	(0) 2.2 (0) 2.1 (0) 2.3	1.1	L1.1:CP# L1.1:S# L1.1:(0)P2#
Fritschel 57-6	General Psychology (U)	I V'		1.1 1.3	1.1	L1.1:CP# L1.1,P1.1:V'>I L1.1,P1.2:CP# L1.1,P1.3:I>V'
Hatch 57-7	Chemistry (U)	IV II'	4.5		1.1 2.2 2.3	L1.1:CP# L2:(0)P>CP L2.3-
Herninghaus 57-8	1)English Comp(9) .1 Lang. Ability .2 Vocabulary .3 Composition .4 Composition 2)Genl Science (9) 3)Spelling (2) .1 Part I .2 Part II	I V'			1.1 2.2	L1.1,C1.1:CP# C1.2:CP# C1.3:I>V' C1.4:CP# C2:CP# C3.1:CP# C3.2:I>V' L2,2,V' - L1.1/L2.2#

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
Honig 57-9	Chemistry (F)	I V V' Vf V'f	 4.4 color slides and tape 4.4 4.5		1.1	L1.1:CP#
Los Angeles City School Districts 57-10	1)Personal Health (U) 2)Geography 3)Introductory Physics	I Io II'			1.1	L1.1:CP# (23 tests) L1.1,C2:II'>I L1.1,C1:I>II' (3 tests)
Macomber and Siegel 57-11	1)Foundations of Human Behavior 2)Physiology 3)Air Science 4)Economics .1 Essay 1 .2 Essay 2 (U)	I IV V'-Id	(Id)7.4	(O)2.1 (O)2.3	1.1 1.2 2.1 2.2 2.4	L1.1:CP# (1st Sem.) L1.1,C1,3,4:I>V' (2nd) L1.1,C2:CP# (2nd sem.) L1.2,C1,2,3:CP# (1st) L1.2,C4:I>V' (1st) L1.2,C1,2,3,4.1:CP# (2nd) L1.2,C4.2:I>V' (2nd) L1.1,Id,S7.4:(O)P2# L1.1,P1:CP# L1.2,C1,2,3,P1:CP# L1.2,C4,P1.1:I>V' L2.1:CP# L2.2/P1# L2.2/(O)P+ L2.2/V'# (1st sem.) L2.2/V'- (2nd sem.) L1.1/L2.2# L1.1:(O)P>CP L2.2/L2.4+

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
Mullin 57-12	"Explorations in Space" (11)	V V'	3.11 3.13 1.1(t)	9.1 "motivated" 9.3 "unmotivated"	1.1 1.1r$_{14}$	L1.1:P9.1>P9.3 L1.1r:P9.1>P9.3 L1.1:S3# L1.1r:S3#
New York State Education Department 57-13	Principles of Accounting Spanish Genetics (U) Psychology Child Growth and Development N. Y. History Child and Curriculum American History Applied Anatomy	I Io II'			1.1	L1.1:CP#
	English(7,10) Citizenship Education(8,10) Algebra(9) Science(9) Plane Geom(10) Biology(10) Spelling(3,5) Arithmetic(3,5) Science(3,7) Mathematics(7)	I V'-I		1.1 1.2 1.3	1.1	L1.1:CP# L1.1,P1:CP#

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
Parsons 57-14	Educational Sociology, Psychology of Child Development. (U)	I Vk VII			1.1 $1.1r_{120}$ 3 $3r_{120}$ 2.2	L1.1:CP# L3:I>Vk L1.1r:CP# L3r:I>Vk L2.2+
Seibert 57-15	Physics (U)	I V'		1.2 1.3	1.1 2.2 1.2	L1.1:CP# L1.1,P1:CP# L1.2:CP# L2.2,V'-
Seibert 57-16	Mechanical (U) Engineering	IV II'			1.1 2.2	L1.1:CP# L2.2,II'-
Seibert 57-17	Mathematics, Calculus (U)	IV V'		1.1 1.2 1.3	1.1 2.2	L1.1:CP# L1.1,P1:CP# L2.2,V'-
Tamminen 57-18	Parent-Education Programs (m)	V' V'	3.03,2.11 (alone) 3.03,2.12 (group)	4F(mothers)	3	L3:S2.12>S2.11
Tucker 57-19	1)Mental Therapy 2)Commercial television	I* V'-I*			3	L3:V'-I,C1>I (12.4%) L3:V'-I,C2>I (5.1%) L3:V'-I,C1>V'-I,C2(9.4%) L3:(V'-I,C1,C2>V'-I,C1 & V'-I,C2) (16.2%)

*regular therapy

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
Becker 58-1	Communication Skills (U) Speaking Writing Reading Listening	I Vk-I I-VIII		1.1 1.3	1.1 2.1 4	L1.1:CP# L1.1:P1.1/(0)P# L1.1:P1.3/(0)P+ L1.1:(0)P>CP L2.1:CP# L2.2:CP+ L2.2:I>Vk>VIII L4:CP#
Becker 58-2	American (U) Government	Id II'od IVa IVd V' Ip		1.1 1.3	1.1 1.1p 2.1 2.2	L1.1:CP# L1.1,P1:CP# L1.1>L1.1p L2.1:CP# L2.2:CP+ L2.2:d>a L2.2,II',V'+ d:I>II'>IV
Bennett 58-3	Accounting I 1) (U)	I V'		9 (drop-outs)	1.1 2.2	L1.1:CP# L2.2:I>V' P9/CP#
	2) Accounting II	I		2,C1,CP	1.1	L1.1:P2#

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
Bennett 58-4	Trigonometry (U)	V' I VIII* (optional) *mimeographed notes		(O)2.1 Experience (O)2.2 Inexper-ienced	1.1 2.2	L1.1:CP# L2.2:(I,VIII,S2.1,PO2.1) >(I,S2.1,PO2.1) >(V',VIII,S2.1,PO2.1) >(V',S2.1,PO2.1) >(I,VIII,S2.1,PO2.2) >(I,VIII,S2.2,PO2.1) >(I,S2.1,PO2.2) >(I,S2.2,PO2.1) >(I,VIII,S2.3,PO2.1) >(I,S2.3,PO2.1) >(I,VIII,S2.2,PO2.2) >(I,S2.2,PO2.2) >(I,VIII,S2.4.PO2.1) >(I,S2.4,PO2.1) >(I,VIII,S2.3,PO2.2) >(I,S2.3,PO2.2) >(I,VIII,S2.4,PO2.2) >(I,S2.4,PO2.2)
Carpenter and Greenhill 58-5 (U)	General (U) Psychology (q.v. 55-2)	IV IVo V'			$1.1r_{218}$	L1.1r:CP#
	General (F) Chemistry	IVo V'			1.1	L1.1:CP#
	Elementary Business Law	IVo↔V' V'↔IVo			1.1	L1.1:CP#
	Sociology 1.Total tests 2.Lecture only	IVo V'			1.1	L1.1,C1:CP# L1.1,C2,:CP#

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
58-5 (cont)	Elementary Meteorology	IV V'			1.1	L1.1:CP#
	General Psychology 1)Exam 1 2)Exam 2 3)Exam 3 4)Final exam 5)Total	IV V' IVp	5.12 (no text) 5.11(text)		1.1 1.1p 1.2	L1.1:CP# L1.1,C3:V'>IV L1.1:S5.12#S5.11p L1.2:CP#
	Music Appreciation	IV V'	6.1 6.1		1.1 1.2	L1.1:CP# L1.2:CP#
	General Chemistry	IVo V'	3.1,3.2,3.3		1.1	L1.1:S3#
	General Psychology	IVo	3.1,3.2,3.3		1.1	L1.1:S3#
	General Chemistry	IVo V'	2.1 2.2-2.6		1.1	L1.1:S2#
	General Psychology	V'	2.1,2.2 2.4,2.5		1.1	L1.1:S2#
	Air Science	V'	2.1,2.2,2.5		1.1	L1.1:S2#
	Principles of Economics	V'	2.1,2.2		1.1	L1.1:S2#
	Music Appreciation	V'	2.1,2.2,2.4	6	1.1 1.2	L1.1:S2# L1.2:P6#

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
58-5 (cont)	1)Test 1					L1.1,C1:S2.2>2.1,2.4
	Psychology of Marriage	Io		4M, 4F	1.1	L1.1:P4#
		V'		4M		L1.1:CP#
		V'		4F		
		V'		4M, 4F		
	Introduction to Education	II'	2.1,6.1		1.1	L1.1:CP#
		Io	2.4,6.1			L1.1:S#
	General Psychology	V'	7.1,7.2,7.3		1.1	L1.1:S7#
	Psychology of Marriage	V'	7.1,5.5		1.1	L1.1:S#
		V'	7.3,5.5			
		V'	7.3,5.4			
	Air Science	V'	7.1	(O)		
		V'	7.3	7.1(Officer)	1.1	L1.1:S#
		V'	7.3	7.2(cadet ")		L1.1:(O)P7#
		V'	7.3	7.3(peer)		
	Elementary Business Law	IV			1.1	L1.1:CP#
		IVo↔V'			2.2	L2.2,CP+
		V'↔ IVo				
		V'				
	General Psychology	V'-Iod	1.33-1.31		1.1	L1.1:CP#
		V'-V'	1.33-1.31		2.2	L2.2,CP+
		V'	1.33-5.6		2.3	L2.3,S+

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
58-5 (cont)	Economics	II'o			1.1	L1.1:CP#
		V'				
		II'o↔V'			2.2	L2.2,CP+
		V'↔II'o				L2.2:II'o>V'
	Air Science	II'o			1.1	L1.1:CP#
		V'			2.2	L2.2,CP+
						L2.2:II'o>V'
	Principles of Economics	V'	1.23-5.6		1.1	L1.1:CP#
		V'-Id	1.23-1.13		1.2	L1.2:V'-Id>V'
	Elementary Meteorology	IV	5.4		1.1	L1.1:CP#
		IV	5.6			L1.1:S#
		V'	5.4			
		V'	5.6			
	General Psychology	V'-VIII*	-5.4		1.1	L1.1:CP#
		V'-VIII*	-5.5			L1.1:S5.4>S5.5>S5.6
		V'-	5.6			
		*workbooks				
	Air Science	V'	6.1		1.1	L1.1:S6.3>S6.1
		V'	6.3			
	General Psychology	V'	6.1		1.1	L1.1:S6#
		V'	6.3			
	Introductory Sociology	IV			1.1	L1.1/L3+
		V'			3	L3:CP#
	Principles of Economics	V'-Ig	1.32-1.31		2.3	L2.3:(S1.23-S1.13)
		V'-Ih	1.23-1.13			>S1.32-1.31)

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
58-5 (cont)	Basis of	II'			1.1	L1.1:CP#
	Courses Taught	V'			2.2	L2.2:II'>V'
	General	V'-VIII*			2.2	L2.2:V'-VIII>V'
	Chemistry	V'				
		*Mimeographed notes				
	Introduction	V'	2.1		2.3	L2.3:S2.1>S2.5-2.8
	to Education	V'	2.5-2.8			
	General	IVo	4.4		2.3	L2.3:S4.4>S4.5
	Chemistry	V'	4.5			
	General	IVo↔V'	2.6,3.1-2.2		2.2*	L1.1:CP#
	Chemistry	IVo↔V'	2.6,3.2-2.2		1.1	L1.1:S#
		IVo↔V'	2.6,3.3-2.2			L2.2:S2>CP
		IV	2.9			L2.2:S3>CP
					*behavioral choice	
	Elementary	IVo			2.21[1]	L2.21:IVo (54%)
	Business Law	V'			2.22[2]	L2.21:V' (42%)
		V'↔IVo			1.1	L2.22:IVo (53%
				[1] verbal choice		L2.22:V' (47%)
				[2] behavioral choice		L2.21/L2.22#
						L2.2/L1.1#

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
58-5 (cont)	Introductory Political Science	V'-IV	1.6-1.6		2.21[1]	L2.21:IV (46%)
					2.22[2]	L2.21:V' (51%)
					1.1	L2.22:IV (27%)
					3	L2.22:V' (70%)
						L2.21/L2.22#
				[1]verbal choice		L2.2/L1.1#
				[2]behavioral choice		L2.2/L3#
	General Psychology	V'↔IV	6.1, 2.2		2.2*	L2.2,S6.1:V' (61%)
		V'↔IV	6.3, 2.5		2.3*	L2.2,S6.1:IV (37%)
						L2.2,S6.3:V' (52%)
				*verbal vote,		L2.2,S6.3:IV (46%)
				majority rules		L2.3,V':S6.1>S6.3
						L2.3,V':S2.2>S2.5
	Introduction to Education	IV	2.7		2.2	L2.2:S2>CP
		V'	2.2		2.3	L2.3:S2.2>S2.7
	Meteorology	I	5.4,5.5	9*	1.1	L1.1:S5#
		V'	5.4,5.5			P9/S5#
				*attendance		
	Summary					L1.1:(O)P>CP
						L2.2:S1>CP
Carpenter 58-6	Typing (HS)	Io			4.	L4:CP#
		I'				
	English-Speech	Io			1.1	L1.1:CP#
		II'			4.	L4:CP#

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
Dreher and	1)Psychology	I		1.1	1.1	L1.1:CP#
Beatty	2)Basic Com-	V'	3.01	1.3	1.2	L1.2:CP#
58-7	munication	V'	3.03	6.1 auding	2.1	L3:I>V'
	3)Creative Arts			6.2 ability	2.2	L1.21:CP#
	4)Economics			9.1 "need	2.3	L1.21,CP:C1,2>C3>C4
	(U)			9.3 to	3	L2.2:I>V'
				achieve"	1.21*	L2.2,CP+
						L2.3,V':S3.03>3.01
						L1.1,P1:CP#
						L1.2,P1:CP#
						L1.1,P6:CP#
						L1.2,P6:CP#
						L1.1,P9:CP#
					*self-	L1.2,P9:CP#
					insight	L2.1/CP#
						L1.2,P1.1,C4:I>V'
						L1.1,P1.1,C1,4:V'>I
						L1.1,P1.3,C1:V'>I
						L1.1,P9.1,C3,4:I>V'
						L1.1,P9.3,C1:V'>I
						L1.2,P9.3,C3:V'>I
Englehart	Physics (HS)	V'f			1.1	L1.1+
58-8		Ip			1.1p	L1.1/L1.1p#

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
Erickson and Chausow 58-9	1)English 101 2)Social Science 3)Biology 4)Political Science 5)Mathematics 6)English 102 7)Social Science 8)Biology (F)	I V' Ip	 3.03	1.1 1.2 1.3	1.1 1.2 1.2p	L1.1,C1,2,4:CP# (Term 1) L1.1,C3:V'>I L1.1,C5,6,7,1:CP# L1.1,C8:V'>I L1.2:CP# L1.2,P1.1:I>V' L1.2,P1.2,1.3:V'>I L1.2p>L1.2
Evans 58-10	"Onset of Puberty in Girls" (m)	V' V'		(0)7.1^1 (0)7.2^2 ^{1}national network ^{2}local station	1.1 2.1	L1.1+ L1.1:P7# L2.1+ L2.1:P7#
Honig 58-11	Chemistry (F)	IV-V'f IV-V'f	1.05-5.5 1.03-1.04		1.1	L1.1:CP#
Irwin 58-12	Speech Correction (U) 1)verbal, objective exam 2)visual, film exam	IVoa↔f V'a↔f	6.1↔6.3 6.1↔6.3		1.1	L1.1,C1,2:S6.1#S6.3 L1.1,C1,2,a,f:IVo#V' L1.1,S6.3,C1:a>f L1.1,S6.1,C2:f>a

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
Kanner	Electricity,	IV	1.49	(0)2.1	1.1	L1.1:S1.49>S1.39
58-13	Power	V'	1.49	(0)2.3	$1.1r_{30}$	L1.1r:S1.49>S1.39
	Maintenance	V'a	1.39	1.1		L1.1,V':a#k
		V'k	1.39	1.3		L1.1,S1.39:P(0)2#
	(M)		1.1(t)	9*		L1.1r,V':a#k
						L1.1r,S1.39:P(0)2#
				*failure to		L1.1:(V'S1.39,P1.1)#
				complete course		(IV,V',S1.49,P1.3)
						CP/P9#
Klapper	Composition (F)	I		1.1	1.1	L1.1:CP#
58-14	1)English R1	V'		1.2	1.2	L1.1,C2,P1.3:V'>I
	2)English R2			1.3		L1.2:CP#
	.1 theme					L1.2,C1,P1:CP#
	writing					L1.2,C1,P1.3:I>V'
						L1.2,C2.1,P1:CP#
						L1.2,C2.1,P1.1:I>V'
						L1.1:(0)P>CP
	Man's Cultural	V'	6.1	1.1	1.1	L1.1:S6.3>S6.1
	Heritage	V'	6.3	1.2	2.3	L2.3:S6.1>S6.3
				1.3		L1.1:P(0)>CP
	History of	I		(0)2.1	1.1	L1.1:CP#
	Civilization	V'		(0)2.3	2.2	L1.1:P(0)>CP
						L2.2,CP+
						L2:(V',PO2.1)>(I,PO2.3)
						L2:(V',PO2.1)#(I,PC2.1)
	Cross Course			9.1*	1.1	L1.1/P9#
	findings			9.3*		P1.1/P9.3+
						P1.3/P9.1+
				*attention		

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
Kumata	Journalism (U)	I			1.1	L1.1,C1:I>II'
58-15	Introduction	II'			2.1	C2:I>II'
	to Advertising	Io				C3:I#II'>Io
	1)final grade					C4:CP#
	2)visuals quiz					C5:I>II'
	3)visuals quiz					C6:CP#
	4)written asgt.					C7:I>II'
	5)special asgt.					L2.1:CP#
	6)mid-term					
	7)final exam					
Kumata	Journalism (U)	I	4.4		1.1	L1.1,C1:CP#
58-16	Introduction	II'	4.5		2.1	C2:CP#
	to Advertising	Io	4.4,4.5			C3:CP#
	1)final grade					C4:CP#
	2)visuals quiz					C6:CP#
	3)visuals quiz					C7:I#Io>II'
	4)assignments					C8:I (75.8%)
	5)special "					:Io (50%)
	6)mid-term exam					:II' (31.6%)
	7)final exam					C9:I (24.2%)
	8)"relevant"					Io (50%)
	9)"irrelevant"					II' (68.4%)
						L2.1:I&Io>II'
Kumata	Social	V'	1.1(t)	(0)7.1[1]	1.1	L1.1:P7#
58-17	Science (U)	IV		(0)7.2[2]	2.1	L1.1:IV>V'
				(0)7.3[3]	2.2	L2.2:CP#
						L2.1:CP#

[1] national authority
[2] department expert
[3] regular instructor

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
Los Angeles City School Districts 58-18	1)Physics (U) 2)Personal Health 3)History 4)Geography	I Io II'	3.1,3.2,3.3 2.1 2.9	1.1 1.2 9* 3 4 *dropped course	1.1 $1.1r_{49-98}$ 2.2 2.3	L1.1:I#II' (12 tests) L1.1,C2:I>II' (2 ") L1.1:Io#I (5 ") L1.1,C2:I>Io (2 ") L1.1,II':S3# L1.1r:CP# L1.1,P1:CP# L1.1,C3,P1.1:I>II' L1.1,C3,P1.2:II'>I L2.2,CP+ L2.2/P3# L2.2/P4# L2.2/P1# L2.2/P9# L2.3:S2.1>S2.9 L2.2:II'>V' L1.1:P(0)>CP
Merrill 58-19	1)Soil Tillage 2)New Developments in Agriculture (m)	V'	3.03	7.1(urban) 7.2(rural non-farm 7.3(farm) 4M 4F	1.1 2.1 2.4	L1.1:P4# L1.1:P7# L1.1:(P7.3,4M)# (P7.1.4F) L2.1:P4,7+ L2.4:P4,7±
Seibert 58-20	English (U)	I V'		1.1 1.2 1.3	1.1 2.2	L1.1:I>V' L1.1,P1.1:V'>I L1.1,P1.2:CP# L1.1,P1.3:I>V' L2.2,CP+

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
Seibert 58-21	Mathematics (F)	IV V'		1.1 1.2	1.1 2.2	L1.1:CP# L1.1,P1.1:V'>IV L1.1,P1.2:CP# L1.1/L2.2# L2.2,CP+
Skaine 58-22	Speech (U)	I V'			1.1 4	L1.1:CP# L4:CP#
Throop 58-23	Mechanical (U) Behavior of Engineering Materials 1)Instrumentation 2)Specimen behavior 3)Theory 4)Machinery	Ic II' Ip			1.1 1.1p 4	L1.1:CP# L1.1>L1.1p L1.1,C1:CP# C2:CP# C3:CP# L4,C4:Ic>II'

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
Barrow and Westley 59-1	"Exploring the News" (6)	V' VI'	6.1 6.1		1.1 1.1r	L1.1:V'>VI' L1.1r:V'>VI'
Ellery 59-2	"Science and Security"(HS)	Vk	6.3	1.1,1.2, 1.3	2.1 $1.1r_{31}$	L2.1:P1# L1.1r:P1.1>P1.2>P1.3
	Formation of Speech Sounds	Vk Vk	6.1(1 cam.) 6.3(2 cam.)		1.1 $1.1r_{31}$ 2.1	L1.1:S6# L1.1r:S6# L2.1:S6#
	Phonetics	Vk Vk	6.1(errors) 6.3(clean)			L1.1:S6# L1.1r:S6# L2.1:S6#
	Semantics	Vk Vk	6.1(elaborate set) 6.3(prosaic set)			L1.1:S6# L1.1r:S6# L2.1:S6.1>S6.3
	Public Address	Vk Vk	6.1(CU only) 6.3(cutting)			L1.1:S6# L1.1r:S6# L2.1:S6.1>S6.3
	Social Aspects of Speech	Vk Vk	6.1(flat light) 6.3(key light)			L1.1:S6# L1.1r:S6# L2.1:S6#

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
Erickson	1)English 101	I	3.01		1.1	L1.1,C4,7,8,10,12:CP#
and Chausow	2)Mathematics	V'	3.03			
(U)	3)Humanities					L1.1,C3,5,11,14,15:
59-3	4)Shorthand					V'>I
	5)Biology					
	6)Physical					
	Science	I	3.01		1.1	L1.1,C1,5,11,13,17:CP#
	7)Accounting	V'k	3.03		1.2	L1.2,C1,5,11,13,17:CP#
	8)Psychology					
	9)Slide Rule					
		I	3.01	1.1	1.1	L1.1,P1,C6,15:CP#
	10)Accounting	V'	3.03	1.3	1.2	L1.2,P1,C6,15:CP#
	11)Biology				2.1	L2.1,P1,C6,15:CP#
	12)Shorthand					
	13)English					
	14)Humanities					
	15)Physical					
	Science					
	16)Political					
	Science					
	17)Social Studies					
	18)Slide Rule					
Kretsinger	"The Friendly	V'f		4M	2.1	L2.1:C1>C2
59-4	Giant"			4F		L2.1+:P8.3/C1+
	1)Essential			4M&F		L2.1-:P8.1/C2+
	2)non-essential			8.1(high movement)		L2.1:P8/C3#
	3)scene-by-			8.3(low movement)		L2.1:P4/P8#
	scene					

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
Public Schools	Summary	I	3.01,2.1		1.1	L1.1:CP# (110 comps)
59-5	(1-12)	V'	3.02,2.4			L1.1:V'>I (29 comps)
						L1.1:I>V' (9 comps)
Atlanta	1)Science (3)	I		4M, 4F	1.1	L1.1(ES):V'>I (all)
	2)Social	V'		7.1(white)		L1.1(HS):V'>I (5 of 12)
	Science (7)			7.2(Negro)		L1.1,P7.1:V'>I(5 of 11)
	3)Health (8)					L1.1,P7.2:V'>I(9 of 9)
	4)General					L1.1,P4M:V'>I (7 of 9)
	Science (9)					L1.1,P4F:V'>I (5 of 9)
	5)American				2.1	L2.1,C4:V'>I (4 of 4)
	History (11)					L2.1,C6:V'>I (1 of 2)
	6)Physics (12)					L2.1,C6:I>V' (1 of 2)
Cincinnati	Biology (9)	I		1.1	1.1	L1.1,P1.1:V'>I
		V'		1.2		P1.2:CP#
				1.3		P1.3:CP#
					2.2	L2.2:CP#
	Driver (10)			1.1	4	L4,P1.1:V'>I (1st sem)
	Education			1.3		L4,P1.3:I>V' (1st sem)
						L4,P1.1:V'>I (2nd sem)
						L4,P1.3:CP# (2nd sem)
					2.2	L2.2,P1.1:V'+
						L2.2,P1.3:I+
Dade County	Florida Heritage (3,4)				1.1	L1.1:CP#
	American " (5,6)					
	Science (7)					
	U.S. History (8)	I				
	English (10)	V'				
	American					
	History (11)					

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
Detroit	1)Spanish (3)	I			1.1	L1.1,C3,4,6:V'>I
	2)Science (5)	V'				L1.1,C1,2,5:CP#
	3)Health (5)			6.		L1.1,P6,C5,6:V'>I
	4)Science (8)					L1.1,P6,C1,2,3,4:CP#
	5)World History (9)					
	6)American Literature (11)					
Jefferson County	1)Science (3,4)	I		1.1	1.1	L1.1,C2,3:V'>I
	2)Social Science (5,6)	V'		1.3	2.2	L1.1,C1:CP#
	3)Spanish (5,6)					L1.1,P1.1:V'>I
						L1.1,P1.3:CP#
						L2.2 +
Milwaukee	1)Science, Health, Safety (5,6)	I			1.1	L1.1,C5,:V'>I
	2)Social Studies (7)	V'	(ES)V',15 min.			L1.1,C1,2,3,4:CP#
	3)Science (9)		(HS)V',30 min.			
	4)Biology (10)					
	5)U. S. History (11)					
Nebraska	1)Mathematics(9)	I		7.1 city	1.1	L1.1:CP#
	2)Algebra(9)	V'		7.3 rural		
	3)Art(9,10,11,12)					
	4)Spanish(9,10,11)					
	5)Geometry(10)					
	6)Physics(11,12)					
	7)English(12)					

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
Norfolk	1)Science(5,6) 2)American History(9) 3)Geometry(10)	I V'			1.1	L1.1,C1:V' > I(4 of 8) L1.1,C1:I>V' (1 of 8) L1.1,C1:CP# (3 of 8) L1.1,C2:V'>I L1.1,C2:CP# L1.1,C3:CP#
North Carolina	1)Arithmetic(8) 2)Physical Science(9) 3)World History(10) 4)U.S.History(11)	I V'			1.1	L1.1,C1:V'>I L1.1,C4:V'>I L1.1,C2,3:CP#
Oklahoma City	1)Social Studies(5,6) 2)Science(4,5,6) 3)Language Arts(4,5,6) 4)Geology(10,11,12) 5)Algebra(11,12) 6)Chemistry(11,12) 7)Physics(11,12) 8)Geometry(11,12)	I V'			1.1	L1.1,C1,2,3:CP# L1.1(HS):I>V' (1 of 6) L1.1(HS):CP# (5 of 6)
Oklahoma State	1)Algebra(11,12) 2)Chemistry(") 3)Physics (") 4)Geometry (") 5)Geology (")	I V'			1.1	L1.1:CP#

Investigator & Number	Content & Level	CP	Situation	Pers. Attr.	Learning	Results
Philadelphia	1)Social Studies (5,6) 2)Science(5,6,8) 3)History(9) 4)Biology(10)	I V'			1.1	L1.1,C1,2,3:CP# L1.1,C4:V'>I
Wichita	1)Enrichment (3,4,5,6) 2)Science(5,6)	I V'			1.1	L1.1:CP#
Seibert and Honig 59-6	Chemistry (U) Laboratory	Ic Ic V'c V'c	1.1(t) 1.1(r) 1.1(t) 1.1(r)		1.1 $1.1r_{35}$ 4 $4r_{35}$	L1.1:CP# L1.1r:CP# L4:CP# L4r:CP#
Stone and Martin 59-7	Graphics I (U) Engineering Drawing	I I'	2.1		1.1 2.2 2.3	L1.1:CP# L2.2:I>I' L2.3:IS2.1>I' L2.2:P(O)>CP L2.2:P(O)2.1,I'>P(O)2.3,I
Washington County CC ETV Project 59-8	1)English (12) 2)U.S.History(11) 3)Geometry(10) 4)Science(6,9) 5)Arithmetic(5) 6)Social Studies(4) 7)Music(4,5,6) 8)Art(1,2,3,4,5,6) 9)Reading(1,2) 10)Numbers(1,2)	Ip V'-Id			1.1 1.2 2.2 3	L1.1,C5:V'-Id>Ip L1.2,C5:V'-Id>Ip L1.1,P1:V'-Id>Ip L2.2,V'-Id+ L3:V'-Id Ip

APPENDIX B - CONTENT

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APPENDIX B (cont) - CONTENT

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APPENDIX C - COMMUNICATION POTENTIAL

No.	I	Io	I'	II'	II'o	III'	IV	IVo	V	V'	VI'	VII	VIII	fk
52-1	x									x				
52-2									x					x
52-3				x			x		x					x
52-4										x				
52-5										x		x		
53-1										x				
54-1	x									x				
54-2							x			x				
54-3							x			x				
54-4		x							x	x				x
54-5							x		x	x				x
54-6								x		x	x		x	
55-1									x					x
55-2							x	x		x				
55-3	x									x			x	
55-4										x	x			
55-5									x					x
55-6									x					x
55-7								x		x	x		x	
55-8										x				
55-9									x					x
56-1		x		x										
56-2									x					x
56-3	x									x				
56-4							x			x				
56-5										x				
56-6									x					x
56-7	x									x				
56-8	x									x				
56-9										x				
56-10							x			x			x	x
56-11								x		x				
56-12	x									x				

APPENDIX C (cont) - COMMUNICATION POTENTIAL

	I	Io	I'	II'	II'o	III'	IV	IVo	V	V'	VI'	VII	VIII	fk
57-1	x	x								x				
57-2	x									x	x		x	
57-3	x								x	x				x
57-4										x				
57-5	x			x										
57-6	x									x				
57-7				x			x							
57-8	x									x				
57-9	x								x	x				x
57-10	x	x		x										
57-11	x						x			x				
57-12									x	x				
57-13	x	x		x						x				
57-14	x								x				x	x
57-15	x									x				
57-16				x			x							
57-17							x			x				
57-18										x				
57-19	x									x				
58-1	x								x				x	x
58-2	x			x	x		x			x				
58-3	x									x				
58-4	x									x				
58-5	x	x		x			x	x		x				
58-6		x	x	x										
58-7	x									x				
58-8	x									x				
58-9	x									x				
58-10										x				
58-11							x			x				x
58-12								x		x				x
58-13	x									x				x
58-14	x									x				
58-15	x	x		x										
58-16	x	x		x										
58-17							x			x				
58-18	x	x		x										
58-19										x				
58-20	x									x				
58-21							x			x				
58-22	x									x				
58-23	x			x										

APPENDIX D - SITUATION

No.	1	2	3	4	5	6	7
52-1							
52-2				x			
52-3	x					x	
52-4	x						
52-5			x				
53-1						x	
54-1							
54-2							
54-3	x						
54-4			x				
54-5	x						x
54-6	x						
55-1	x						
55-2	x	x					x
55-3							
55-4	x						
55-5	x						
55-6							
55-7							
55-8							
55-9	x					x	
56-1							
56-2	x						
56-3							
56-4	x						
56-5			x				
56-6	x					x	
56-7							
56-8							
56-9							
56-10	x						
56-11			x				
56-12							

APPENDIX D (cont) - SITUATION

No.	1	2	3	4	5	6	7
57-1							
57-2	x					x	
57-3							
57-4							
57-5					x	x	
57-6							
57-7				x			
57-8							
57-9				x			
57-10							
57-11							x
57-12	x		x				
57-13							
57-14							
57-15							
57-16							
57-17							
57-18		x	x				
57-19							
58-1							
58-2							
58-3							
58-4							
58-5	x	x	x	x	x	x	x
58-6							
58-7			x				
58-8							
58-9			x				
58-10							
58-11	x				x		
58-12						x	
58-13	x						
58-14						x	
58-15							
58-16				x			
58-17	x						
58-18		x	x				
58-19			x				
58-20							
58-21							
58-22							
58-23							

APPENDIX E - PERSONAL ATTRIBUTES

No.	1	2	3	4	5	6	7	8	9
52-1	x								
52-2									
52-3									
52-4							x		
52-5									
53-1							x		
54-1	x								
54-2	x			x					
54-3									
54-4									
54-5	x								
54-6	x								
55-1							x		
55-2									
55-3									
55-4									
55-5									
55-6									
55-7									
55-8									
55-9									
56-1	x								
56-2				x					
56-3									
56-4									
56-5									
56-6	x		x	x			x		
56-7									
56-8	x								
56-9									
56-10									
56-11									
56-12									

x = student

0 = instructor or source

APPENDIX E (cont) - PERSONAL ATTRIBUTES

No.	1	2	3	4	5	6	7	8	9
57-1	x	x							
57-2	x								
57-3				x					
57-4	x								
57-5		0							
57-6	x								
57-7									
57-8									
57-9									
57-10									
57-11		0							
57-12									x
57-13	x								
57-14									
57-15	x								
57-16									
57-17	x								
57-18				x					
57-19									
58-1	x								
58-2	x								
58-3		x							x
58-4		0							
58-5				x		x	0		x
58-6									
58-7	x					x			x
58-8									
58-9	x								
58-10							0		
58-11									
58-12									
58-13	x	0							x
58-14	x	0							x
58-15									
58-16									
58-17							0		
58-18	x		x	x					x
58-19				x			x		
58-20	x								
58-21	x								
58-22									
58-23									

APPENDIX F - LEARNING

No.	1.1	1.2	2.1	2.2	2.3	2.4	3	4	r	p
52-1	x									
52-2	x									
52-3	x			x						
52-4	x			x					x	
52-5	x									x
53-1	x				x					
54-1	x									
54-2	x									
54-3	x								x	
54-4	x									
54-5	x							x	x	
54-6	x									
55-1	x									
55-2	x		x	x			x			
55-3	x									
55-4	x	x								
55-5	x									
55-6	x									
55-7									x	
55-8	x		x							
55-9	x								x	
56-1	x			x						
56-2	x		x	x						
56-3	x									
56-4	x									
56-5				x						
56-6	x			x	x					
56-7	x	x						x		
56-8	x									
56-9			x							
56-10	x									
56-11	x			x						
56-12	x									

APPENDIX F (cont) - LEARNING

No.	1.1	1.2	2.1	2.2	2.3	2.4	3	4	r	p
57-1									x	
57-2	x									
57-3	x		x	x						
57-4	x		x							
57-5	x									
57-6	x									
57-7	x			x	x					
57-8	x			x						
57-9	x									
57-10	x									
57-11	x	x	x	x		x				
57-12	x								x	
57-13	x									
57-14	x			x			x		x	
57-15	x	x		x						
57-16	x			x						
57-17	x			x						
57-18							x			
57-19							x			
58-1	x		x					x		
58-2	x		x	x						x
58-3	x			x						
58-4	x			x						
58-5	x	x		x	x		x		x	x
58-6	x							x		
58-7	x	x	x	x	x		x			
58-8	x									x
58-9	x	x								x
58-10	x		x							
58-11	x									
58-12	x									
58-13	x								x	
58-14	x	x		x	x					
58-15	x		x							
58-16	x		x							
58-17	x		x	x						
58-18	x			x	x				x	
58-19	x		x			x				
58-20	x			x						
58-21	x			x						
58-22	x							x		
58-23	x							x		x

APPENDIX G - CLASSIFICATION SYSTEM KEY

CONTENT, LEVEL (C)

Grades
1-12

F-Freshman
So-Soph.
J-Junior
Sr-Senior
G-Graduate
M-Military
m-Misc.

ES-Elem.
HS-High
U-Univ.

> favored over

// no sig.dif. or rel.

+ positive

- negative

: results follow

/ relationship

% per cent

COMMUNICATION POTENTIAL (CP)

I ←Verbal→
←Visual→

II ←Verbal→
Visual→

III ←Verbal→

IV Verbal→
←Visual→

V Verbal→
Visual→

VI Verbal→

VII ←Written→

VIII Written→

a lecture
c laboratory
d discussion
f film
g immediate
h delayed
i interview, panel
k kinescope
o originating room
' electronic
- followed by
↔ rotating

SITUATION (S)

1. Frequency, length, time
.1 single
.2 2 days
.3 3 days
.4 1 week
.5 2 weeks
.6 3 weeks
.7 1 month
.8 2 months
.9 3 months+
.01 15-20 min.
.02 30 min.
.03 50-60 min.
.04 2 hours
.05 3 hours
.06 4 hours
.07 5 hours
.08 6 hours
.09 7 hours+

2. No. Students
.1 25 or less
.2 26-50
.3 51-75
.4 76-100
.5 101-125
.6 126-150
.7 151-175
.8 176-200
.9 201 or more

3. Phys. Arr.
.1 front
.2 middle
.3 rear

.01 classroom
.02 lecture hall
.03 home

4. Sensory
.1 temp.
.2 vent.
.3 light
.4 color
.5 black and white

5. Req. and Assg.
.1 reading
.2 written
.3 presentation
.4 required
.5 optional
.6 indept. study

6. Unique Utilization
.1 maximum
.2 average
.3 minimum

7. Other pers.
.1 none
.2 partial
.3 full-time
.4 suppl. instr.

PERSONAL ATTRIBUTES (P)

1. Intelligence
2. Experience
3. Age
4. Sex
5. Extracurricular
6. Auding, listening
7. Status
8. Physical
9. Interest, level of aspr.

.1 high
.2 avg.
.3 low

(0) Instructor

LEARNING (L)

1. Cognitive
.1 Information gain, achievement
.2 Critical thinking
2. Motivation (like or dislike)
.1 Content
.2 Communication Potential
.3 Situation
.4 Instructor
3. Socialization
4. Psychomotor
r - Retention (no. [illegible]s days)
p - prior or control

BIBLIOGRAPHY

Correlated Reports

52-1 Fritz, M. F., Humphrey, J. E., Greenlee, J. A., and Madison, R. L. *Survey of Television Utilization in Army Training*. Port Washington, Long Island, New York: Special Devices Center, December 31, 1952.

52-2 Jackson, R. *Learning from Kinescopes and Films*. Port Washington, Long Island, New York: Special Devices Center, April, 1952.

52-3 Rock, Robert T. Jr., Duva, James S., and Murray, John E. *Training by Television: The Comparative Effectiveness of Instruction by Television, Television Recordings, and Conventional Classroom Procedures*. Port Washington, Long Island, New York: Special Devices Center. (no date, 1952?)

52-4 Rock, Robert T. Jr., Duva, James S., and Murray, John E. *Training by Television: A Study in Learning and Retention*. Port Washington, Long Island, New York: Special Devices Center. (no date, 1952?)

52-5 Stromberg, E. L. "College Credit for Television Home Study." *American Psychologist*, VII (1952), 507-509.

53-1 Vernon, M. D. "Perception and Understanding of Instructional Television Programmes." *British Journal of Psychology*, XLIV (1953), 116-126.

54-1 Allen, M. Robert. *Quartermaster Training Command Educational-Television Study*. Fort Lee, Virginia: Quartermaster School, Quartermaster Training Command, June 3, 1954.

54-2 Anderson, G. R. and VanderMeer, A. W. "A Comparative Study of the Effectiveness of Lessons on the Slide Rule Presented Via Television and in Person." *The Mathematics Teacher*, XLVII (1954) 323-327.

54-3 Boone, W. F. *Evaluation of the U. S. Naval Academy Educational Television as a Teaching Aid*. Annapolis: United States Naval Academy, October 29, 1954.

54-4 Husband, Richard W. "Television versus Classroom for Learning General Psychology." *American Psychologist*, IX (1954), 181-183.

54-5 Kanner, Joseph H, Runyon, Richard P., and Desiderato, Otello. *Television in Army Training: Evaluation of Television in Army Basic Training*. Technical Report 14. Washington, D. C.: Human Resources Research Office, The George Washington University, November, 1954.

54-6 Williams, D. C. "Mass Media and Learning--An Experiment." *Explorations*, No. 3 (1954) 75-82.

55-1 Belson, W. A. *"Facts and Figures." The Comprehensibility of Two Programmes in the Facts and Figures Series*. London: British Broadcasting Corporation, March 17, 1955. An Audience Research Report.

55-2 Carpenter, C. R. and Greenhill, L. P. *An Investigation of Closed Circuit Television for Teaching University Courses*. Instructional Television Research Project No. One. University Park, Pennsylvania: Pennsylvania State University, July 31, 1955.

55-3 Evans, Richard I, Roney, H. Burr, and McAdams, Walter J. "An Evaluation of the Effectiveness of Instruction and Audience Reaction to Programming on An Educational Television Station." *Journal of Applied Psychology*, XXXIX (1955), 277-279.

55-4 Frank, J. H. "An Evaluation of Closed Circuit Television for Interceptor Pilot Training." *Dissertation Abstracts*, XV (1955) 2060-2061.

55-5 Hard, C. G. and Watson, D. P. "Testing Scientific Terminology on Television." *Science Education*, XXXIX (1955) 140-141.

55-6 Hurst, P. M., Jr. *Relative Effectiveness of Verbal Introductions to Kinescope Recordings and Training Films*. Technical Report. Port Washington, Long Island, New York: Special Devices Center, May, 1955.

55-7 Paul, J. and Ogilvie, J. C. "Mass Media and Retention." *Explorations*, No. 4 (1955), 120-123.

55-8 Stanley, De G. *Educational Television Programs and Evaluations, 1954-55*. A Report to Dr. Ralph Dailard, Superintendent. San Diego, California: San Diego City Schools, Instructional Aids Department, June 30, 1955. (Duplicated.)

55-9 Ulrich, John H. "An Experimental Study of the Acquisition of Information from Three Types of Recorded Television Presentations." *Dissertation Abstracts*, XV (1955), 2346.

56-1 Ambrosino, M. J., Dunstan, W. H. and Haake, B. F. *The Schenectady Experiment*. New York: The Schenectady Public Schools. (no date, 1956?)

56-2 Brandon, John Roger. "The Relative Effectiveness of Lecture, Interview, and Discussion Methods of Presenting Factual Information by Television." *Speech Monographs*, XXIII (1956), 118.

56-3 *A Study of the Effectiveness of Television as a Medium of Instruction in High School Chemistry*. Cincinnati Public Schools, June, 1956. (Mimeographed.)

56-4 Desiderato, Otello L., Kanner, Joseph H., and Runyon, Richard P. "Procedures for Improving Television Instruction." *Audio-Visual Communication Review*, IV (1956), 57-63.

56-5 Evans, Richard I. "An Examination of Students' Attitudes Toward Television as a Medium of Instruction in a Psychology Course." *Journal of Applied Psychology*, XL (1956), 32-34.

56-6 Jorgensen, Erung, S. Jr. "The Relative Effectiveness of Three Methods of Television Newscasting." *Speech Monographs*, XXIII (1956), 120-121.

56-7 Pasewark, William R. *Teaching Typewriting Through Television*, Research Report No. 17. East Lansing, Michigan: Michigan State University, October, 1956.

56-8 Pollock, Thomas C. *et al*. *Closed-Circuit Television as a Medium of Instruction, 1955-56*. New York: New York University, October, 1956.

56-9 Schlaak, Ottmer F. "The Planning, Production, and Evaluation of Two Experimental Series of Classroom Telecasts for Use in the Intermediate Grades in the Columbus, Ohio, Area." *Speech Monographs*, XXIII (1956), 121-122.

56-10 Tannenbaum, Percy H. *Instruction Through Television: A Comparative Study*. Urbana, Illinois: Institute of Communication Research, University of Illinois, June, 1956.

56-11 Tannenbaum, Percy H. *Instruction Through Television: An Experimental Study*. Urbana, Illinois: Institute of Communications Research, University of Illinois, 1956.

56-12 Willis, B. C. *Evaluation Report of the Two-Week Experiment of Direct Teaching on Television*. Chicago: Chicago Public Schools, 1956. (Duplicated.)

57-1 Benschoter, R. P. and Charles, D. C. "Retention of Classroom and Television Learning." *Journal of Applied Psychology*, XLI (1957), 253-256.

57-2 Carpenter, E. "The New Languages." *Explorations*, No. 7 (1957) 4-21.

57-3 Champa, V. Anthony. "Television: Its Effectiveness in Ninth Grade Science Classroom Teaching." *Dissertation Abstracts*, XVII (1957), 2876-2877.

57-4 *An Adventure in Educational Television, A Report on "Asia in Ferment."* Connecticut State Department of Education, Division of Instructional Service, 1957.

57-5 Davies, Vernon, Gross, Edward and Short, James F., Jr. *The Relationship of Teaching Effectiveness to Class Size and Method of Instruction*. The State College of Washington, July 1, 1957.

57-6 Fritschel, A. L. *Teaching General Psychology by Closed-Circuit Television*. Western Illinois State College, June, 1957. (Dittoed)

57-7 Hatch, Conrad V. *Student Attitudes Toward TV as a Medium of Instruction*. Oregon State College, May, 1957. (Ditto.)

57-8 Herminghaus, Earl G. *An Investigation of Television Teaching*. The St. Louis Educational Television Commission and the St. Louis Public Schools, September, 1956 and February, 1957.

57-9 Honig, J. H. *The Utilization of Audio-Visual Aids in the General Chemistry Laboratory Work at Purdue University*. Lafayette, Indiana: Purdue University, May, 1957.

57-10 *An Evaluation of Closed-Circuit Television for Teaching Junior College Courses*. Los Angeles: Los Angeles City School Districts, 1957.

57-11 Macomber, F. G. and Siegel, Laurence. *Experimental Study in Instructional Procedures*. Report No. 2. Oxford, Ohio: Miami University, October 1, 1957.

57-12 Mullin, Daniel W. "An Experimental Study of Retention in Educational Television." *Speech Monographs*, XXIV (1957), 31-38.

57-13 *Progress Report on Educational Television, New York State Educational Department Experiment--"Instructional Television."* Albany, New York: The University of the State of New York, The State Education Department, August 30, 1957.

57-14 Parsons, T. S. "Comparison of Instruction by Kinescope, Correspondence Study, and Customary Classroom Procedures," *Journal of Educational Psychology*, XLVIII (January, 1957), 27-40.

57-15 Seibert, Warren F. *A Brief Report and Evaluation of Closed-Circuit Television Instruction in Physics 230/240*. Audio-Visual Center, Purdue University. (Mimeographed.) (no date, 1957?)

57-16 Seibert, Warren F. *A Brief Report and Evaluation of Closed-Circuit Television Instruction in Mechanical Engineering 360*. Audio-Visual Center, Purdue, University. (Mimeo) (no date, 1957?)

57-17 Seibert, Warren F. *A Brief Report and Evaluation of Closed-Circuit Television Instruction in the First Semester Calculus Course*. Audio-Visual Center, Purdue University, July, 1957. (Mimeographed.)

57-18 Tamminen, Armas Wayne. "An Evaluation of Changes in Parent's Attitudes Toward Parent-Child Relationships Occurring During a Televised Program of Parent Panel Discussions." *Dissertation Abstracts*, XVII (1957), 1268-1269.

57-19 Tucker, Hyman, Lewis, Richard B., Martin, Gaether L. and Over, Charles, H. R. "Television Therapy, Effectiveness of Closed-Circuit Television as a Medium for Therapy in Treatment of the Mentally Ill." *A.M.A. Archives of Neurology and Psychiatry*, LXX (January, 1957), 57-69.

58-1 Becker, Samuel L., Dallinger, Carl A., Crosby, Harry H., Gold, David. *Communication Skills, An Experiment in Instructional Methods*. Iowa City: State University of Iowa, August, 1958.

58-2 Becker, Samuel L., Murray, James N., Jr., Bechtoldt, Harold P. *Teaching by the Discussion Method*. Iowa City: State University of Iowa, 1958.

58-3 Bennett, J. Jefferson. *Accounting I by Closed-Circuit Television*. University of Alabama, 1958. (Duplicated.)

58-4 Bennett, J. Jefferson. *Trigonometry by Means of Closed-Circuit Television*. University of Alabama, 1958. (Duplicated.)

58-5 Carpenter, C. R., and Greenhill, L. P. *An Investigation of Closed-Circuit Television for Teaching University Courses*. Instructional Television Research Project Number Two. University Park, Pennsylvania: The Pennsylvania State University, Spring, 1958.

58-6 Carpenter, William G., Fair, Jean E., Heald, James E. and Mitchell, Wanda B. "Closed-Circuit Television is Used at Evanston Township High School." *The Bulletin*, National Association of Secondary School Principals, January, 1958.

58-7 Dreher, Robert E. and Beatty, Walcott H. *Instructional Television Research, Project Number One: An Experimental Study of College Instruction Using Broadcast Television*. San Francisco, California: San Francisco State College, April, 1958.

58-8 Englehart, Max D., Schwachtgen, Edward C., and Nee, Mary M. "Summary of Report on the Instructional Experiment in High School Physics in the Chicago Public Schools." *Audio-Visual Communication Review*, VI, No. 2 (Spring, 1958), 157.

58-9 Erickson, Clifford G. and Chausow, Hymen, M. *The Chicago City Junior College Experiment in Offering College Courses for Credit via Open Circuit Television*. Chicago, Illinois: Chicago City Junior College, March, 1958.

58-10 Evans, R. I. and Asher, J. J. *An Investigation of Some Aspects of the Social Psychological Impact of an Educational Television Program*. University of Houston, April, 1958.

58-11 Honig, J. M., Seibert, W. F., Moses, D. F. *The Utilization of Audio-Visual Aids in the General Chemistry Laboratory Work at Purdue University*. Lafayette, Indiana: Purdue University, August, 1958.

58-12 Irwin, John V., and Aronson, Arnold E. *Television Teaching, Conventional Lecture versus Highly Visualized Film Presentation*. Television Laboratory, Bulletin No. 11. University of Wisconsin, December 15, 1958. (Mimeographed.)

58-13 Kanner, Joseph H., Mindak, William A. and Katz, Sanford. *Television in Army Training, The Application of Television and Kinescope Recordings to Reduce Instructor and Student Training Time and Training Costs*. Washington, D. C.: Department of the Army, Office of the Chief Signal Officer, June, 1958.

58-14 Klapper, Hope L. *Closed-Circuit Television as a Medium of Instruction at New York University, 1956-1957*. New York: New York University, 1958.

58-15 Kumata, H. *Teaching Advertising by Television*. Communications Research Center, Michigan State University, 1958.

58-16 Kumata, H. *Teaching Advertising by Television--Study II*. Communications Research Center, Michigan State University, 1958.

58-17 Kumata, H. "Attitude Change and Learning as a Function of Prestige of Instructor and Mode of Presentation." *Audio-Visual Communication Review*, XI, No. 3 (Summer, 1958). (Abstract.)

58-18 *An Evaluation of Closed Circuit Ihstructional Television*, Report No. 2. Los Angeles, California: Los Angeles Junior Colleges, 1958.

58-19 Merrill, Irving R. *The Impact of an Educational Television Series*, WKAR-TV Research Report 573M. East Lansing, Michigan: Michigan State University, April, 1958.

58-20 Seibert, Warren F. *An Evaluation of Televised Instruction in College English Composition*. Audio-Visual Center, Purdue University, July, 1958.

58-21 Seibert, Warren F. *An Evaluation of Televised Instruction in College Freshman Mathematics*. Audio-Visual Center, Purdue University, July, 1958.

58-22 Skaine, James C. *A Study Evaluating the Conventional and Televised Lecture Methods as Employed in the Speech I Course at the State University of South Dakota*. State University of South Dakota, 1958.

58-23 Throop, Joseph F., Assini, Lewis T., Boguslavsky, George W. *The Effectiveness of Laboratory Instruction in Strength of Materials by Closed-Circuit Television*. Troy, New York: Rensselaer Polytechnic Institute, November 8, 1958.

59-1 Barrow, Lionel C. Jr., and Westley, Bruce H. "Comparative Effectiveness of Radio and Television." *Audio-Visual Communication Review*, VII, No. 1 (Winter, 1959), 14-23.

59-2 Ellery, John B. *A Pilot Study of the Nature of Aesthetic Experiences Associated with Television and Its Place in Education*. Detroit, Michigan: Wayne State University, Division of Broadcasting, January 15, 1959.

59-3 Erickson, Clifford G. and Chausow, Hymen, M. *The Chicago City Junior College Experiment in Offering College Courses for Credit via Open Circuit Television, A Report of the Second Year of a Three Year Project*. Chicago City Junior College, March, 1959.

59-4 Kretsinger, Elwood A. "An Experimental Study of Restiveness in Preschool Educational Television Audiences." *Speech Monographs*, XXVI, No. 1 (March, 1959), 72-77.

59-5 *The National Program in the Use of Television in the Public Schools, A Report on the First Year, 1957-58*. New York: The Fund for the Advancement of Education, January, 1959.

59-6 Seibert, Warren F. and Honig, J. M. *A Brief Study of Televised Laboratory Instruction*, TVPR Report No. 8 (February, 1959), Audio-Visual Center, Purdue University, Lafayette, Indiana.

59-7 Stone, Oliver, and Martin, John R. *Instruction in Graphics by Closed-Circuit Television*. Research Report Number 948-6, Cleveland Ohio: Case Institute of Technology. January, 1959.

59-8 *Washington County Closed-Circuit Educational Television Project, Progress Report*, Hagerstown, Maryland: Board of Education, March, 1959.

Books

Adams, John C., Carpenter, C. R., and Smith, Dorothy R. (eds.). *College Teaching by Television*. Washington, D. C.: American Council on Education, 1958.

Bloom, Benjamin S. (ed.). *Taxonomy of Educational Objectives*. New York: Longmans, Green Co., 1956.

Bryson, Lyman (ed.). *The Communication of Ideas*. New York: Harper & Brothers, 1948.

Deutschmann, J. Paul. *Introduction to Mass Communications Research*. "Measurement in Communication Research." Edited by Nafziger, R. O. and White, D. M. Baton Rouge: Louisiana State University Press, 1958.

Faust, Clarence H. *College Teaching by Television*. "Educational Philosophy and Television." Edited by Adams, John C., Carpenter, C. R., and Smith, Dorothy R. Washington, D. C.: American Council on Education, 1958.

Hilgard, Ernest R. *Theories of Learning*. New York: Appleton-Century-Crofts, Inc., 1948.

Hovland, Carl I. *Reader in Public Opinion and Communication*. "Social Communication." Edited by Berelson, B. and Janowitz, M. Glencoe, Illinois: The Free Press, 1953.

Hovland, Carl I., Janis, Irving L. and Kelley, Harold H. *Communication and Persuasion*. New Haven: Yale University Press, 1953.

Kelley, Earl C. *Education for What is Real*. New York: Harper & Bros., 1947.

Lasswell, Harold D. *The Communication of Ideas*. "The Structure and Function of Communication in Society." Edited by Bryson, L. New York: Harper & Bros., 1948.

Lewin, Kurt. *Field Theory in Social Science*. The Research Center for Group Dynamics, University of Michigan. New York: Harper & Bros., 1951.

Lumsdaine, Arthur A. and May, Mark A. *Learning from Films*. New Haven, Connecticut: Yale Motion Picture Research Project, Yale University Press, 1958.

Miller, Neal E. *College Teaching by Television*. "Principles of Learning by Televised Instruction." Edited by Adams, John C., Carpenter, C. R., and Smith, Dorothy R. Washington, D. C.: American Council on Education, 1958.

Newsom, Carroll V. (ed.). A Television Policy for Education. Washington, D. C.: American Council on Education, 1952.

Rasey, Marie I. Toward Maturity. New York: Hinds, Hayden & Eldridge, Inc., 1947.

Schramm, Wilbur (ed.). The Process and Effects of Mass Communication. "How Communication Works." Urbana, Illinois: University of Illinois Press, 1954.

Schramm, Wilbur. The Process and Effects of Mass Communication. "The Nature of Channels." Urbana, Illinois: University of Illinois Press, 1954.

Stouffer, S. A. Reader in Public Opinion and Communication. "Some Observations on Study Design." Edited by Berelson, B. and Janowitz, M. Glencoe, Illinois: The Free Press, 1953.

Tannenbaum, Percy H. Introduction to Mass Communications Research. "Experimental Method in Communication Research." Edited by Nafziger, R. O. and White, D. M. Baton Rouge: Louisiana State University Press, 1958.

Teaching by Closed-Circuit Television. Washington, D. C.: American Council on Education, 1956.

Thorpe, Louis P. and Schmuller, Allen M. Contemporary Theories of Learning. New York: The Ronald Press Co., 1954.

Periodicals

AERT Journal, Association for Education by Radio-TV. Chicago, Illinois.

Allen, William H. "Audio-Visual Materials." Review of Educational Research, XXVI (April, 1956), 125-156.

Allen, William H. "Research on New Educational Media: Summary and Problems." Audio-Visual Communication Review, VII, No. 2 (Spring, 1959), 83-96.

The American Mathematical Monthly. CXV, No. 6 (June-July, 1958).

American Psychologist. X, No. 10 (October, 1955).

"Appraisal of the Current Status of Television as a Medium of Instruction." The North Central Association Quarterly, XXXII, No. 4 (April, 1958). Reprint.

Atyeo, H. C. "Teaching with Television." *Association of American Colleges Bulletin*, XLIV (May, 1958), 265-274.

Baldwin, M. W., Jr. "Subjective Measurements in Television." *American Psychologist*, IX (1954), 231-34.

Becker, Samuel L. "Research Needs for Instructional Television." *NAEB Journal* (January, 1959).

Berlo, David K. and Gulley, Halbert E. "Some Determinants of the Effect of Oral Communication in Producing Attitude Change and Learning." *Speech Monographs*, XXIV (1957), 10-20.

Birdwhistell, R. "Kinesics and Communication." *Explorations*, No. 3 (1954), 31-41.

Boelens, J. and Chambers, P. A. "Application of Television Techniques and Components to the Design of Tactical Trainers." *Psychological Abstracts*, XXXI:3934 (1957). Abstract.

Capraro, Thomas C. "A Study of the Effects of Class Size, Supervisory Status, and Two-way Communication upon Learning and Attitudes of AF-ROTC Cadets in a Closed-Circuit Instructional Television Program." *Dissertation Abstracts*, 17 (1957), 270.

Carpenter, C. R. "Psychological Research Using Television." *American Psychologist*, X, No. 10 (October, 1955), 606-610.

Carroll, John B. "Communication Theory, Linguistics, and Psycholinguistics." *Review of Educational Research*. XXVIII, No. 2 (April, 1958).

Cherry, E. Colin. "On the Validity of Applying Communication Theory to Experimental Psychology." *British Journal of Psychology*, XLVIII (1957), 176-188.

Collier, N. P. "Music Teaching TV Experiment." *Music Educators Journal*. XLV (November, 1958), 38-40.

Cook, Fred S. "Teaching Business Subjects by Television." *Business Education World*. XXXVIII, No. 7 (March, 1958), 13.

Cook, Fred S. "Popular Education via TV." *Systems for Educators*. (March-April, 1957), 13-14.

Crawford, T. James. "Television Typing Research." *The Balance Sheet*. XXXIX, No. 4 (December, 1957), 148-149.

Cutler, R. L., McKeachie, W. J. and McNeill, E. B. "Teaching Psychology by Telephone." *American Psychologist*. XIII (September, 1958), 551-552.

"Design for Learning." *Saturday Review*. XLII, No. 7 (February 14, 1959), 17.

Educational Television Newsletter. Joint Council on Educational Television. Washington, D. C.

Educational Television - Special Number. *Higher Education*. VII, No. 15 (1951).

Evans, Richard I. "Social Psychology on Television: Experimental Programming." *American Psychologist*. XII (1957), 531.

Fortuin, G. J. "Visual Acuity in Connection with Television." *Psychological Abstracts*. XXX:309 (1956), 29.

Geddes, L. A., Hoff, H. E. and Spencer, W. A. "The 'Broadcast Demonstration' in the Physiology Laboratory." *The Journal of Medical Education*. XXXIV, No. 2 (February, 1959), 107-117.

Gerbner, George. "On Content Analysis and Critical Research in Mass Communication." *Audio-Visual Communication Review*. VI, No. 2 (Spring, 1958), 85-108.

Gerbner, George. "Toward a General Model of Communication." *Audio-Visual Communication Review*. IV (1956), 171-199.

"Graphic Communication and the Crisis in Education." *Audio-Visual Communication Review*. V, No. 3 (Summer, 1957).

Greenhill, L. P., Carpenter, C. R., and Ray, W. S. "Further Studies of the Use of Television for University Teaching." *Audio-Visual Communication Review*. IV (1956), 200-215.

Hoban, Charles F. "Hope and Fulfillment in Educational Television Research." *Audio-Visual Communication Review*. VI, No. 3 (Summer, 1958), 165-171.

Hovland, Carl I. "Reconciling Conflicting Results Derived from Experimental and Survey Studies of Attitude Change." *American Psychologist*. XIV (1959), 8-17.

Huntley, S. L. "Color as an Emotional Factor in Television." *Journal of Broadcasting*. II, No. 3 (1958), 259-262.

Journal of Educational Sociology. Special Issue, Television and College Teaching. XXXI, No. 9 (May, 1958).

Kane, E. B. "Science on Television." *Baltimore Bulletin of Education*. XXVIII (March-May, 1951), 2-4.

Kanner, Joseph H. "Future Trends in Television Teaching and Research." *Audio-Visual Communication Review*. V (1957), 513-527.

Kanner, Joseph H. "Teaching by Television in the Army--An Overview." *Audio-Visual Communication Review*. VI, No. 3 (Summer, 1958), 172-188. Reprint.

Kanner, Joseph H., Mindak, William A., Katz, Sanford and Goldsmith, Peter. "Television in Army Training." *Audio-Visual Communication Review*. VI (1958), 255-291. Reprint.

Kumata, Hideya and Deutschmann, Paul J. "Mass Media: Journalism, Broadcasting." *Review of Educational Research*. XXVIII (April, 1958). 148-158.

Lazarsfeld, Paul F. "Why Is So Little Known About the Effects of Television on Children and What Can Be Done?" *Public Opinion Quarterly*, XIX (1955), 243-251.

Letton, Mildred C. "ETV: the Experiments Go On." *Elementary School Journal*. LIX (December, 1958), 123-127.

Lewis, P. "Closed-Circuit Roundup." *Educational Screen*. XXXVI (1957), 472-477.

Lewis, P. "TV Takes a Test." *Educational Screen*. XXIX (1950), 196-198, 203.

Masiko, P. Jr. "What Research Tells Us About Teaching by Television." *Junior College Journal*. XXIX (September, 1958), 11-14.

McClarty, E. L. "Auding Ability Related to Achievement in Two Telecourses." *Dissertation Abstracts*. XVIII (1958), 531.

McKeachie, W. J. "TV for College Instruction." *Improving College and University Teaching*. (Summer, 1959), 84-89. Reprint.

McKinney, F. and Hillix, W. A. "A Personal Adjustment Television Program." *American Psychologist*. XI (1956), 672-676.

McLuhan, Marshall. "Notes on Media as Art Forms." *Explorations*. No. 2 (1954), 6-13.

Miles, Vaden W. and VanDeventer, W. C. "Research in Teaching College Science." *College and University Bulletin*. XI, No. 8 (March 1, 1959).

Moore, Phelma. "TV and Business Education." *The Balance Sheet*. XL, No. 7 (March, 1959), 292-293.

Nachman, M. and Opochinsky. S. "The Effects of Different Teaching Methods: A Methodological Study." *Journal of Educational Psychology*. XLIX, No. 5 (1958), 245-249.

NAEB Research Fact Sheets. The National Association of Educational Broadcasters. Urbana, Illinois.

"NAEB Research Fact Sheets and Index." *NAEB Journal*. The National Association of Educational Broadcasters, XVIII, No. 5 (February, 1959).

Newburn, H. K. "Television and the Future of Education." *The Educational Forum*. (May, 1958). (Reprint)

Newcomb, Theodore M. "An Approach to the Study of Communicative Arts." *Psychological Review*, LX (1953), 393-404.

Nixon, R. D. "Symposium on Screen Viewing. II. The Viewing of Television Screens." *Psychological Abstracts*, XXXII, No. 3444 (1958), 205-216. (Transactions of the Illuminating Engineering Society, London, 1956, 21).

Pearlin, Leonard. "The Social and Psychological Setting of Communications Behavior: An Analysis of Television Viewing." *Dissertation Abstracts*, XVII (1957), 1142-1143.

Pollock, Thomas C. "Why Experiment with Television?" *Educational Screen*, XXXV (1956), 8-9.

Remenyi, J. "Literature on Television." *School and Society*, LXXV (1952), 70-72.

Runyon, Richard P., Desiderato, Otello L., and Kanner, Joseph H. "Factors Leading to Effective Television Instruction." *Audio-Visual Communication Review*, III (1955), 264-273. (Reprint.)

Runyon, Richard P., and Kanner, Joseph A. "Present Status of Signal Corps Television Research." *Audio-Visual Communication Review*, IV (1956), 83-91. (Reprint.)

Sherburne, E. G. Jr. "Color Television and Educational TV." *Audio-Visual Communication Review*, II (1954), 208-215.

Stromberg, E. L. "A Demonstration of 'Subjective' Colors in Television." *American Journal of Psychology*, LXVI (1953), 636-637.

Tannenbaum, Percy H. "Music Background in the Judgment of Stage and Television Drama." *Audio-Visual Communication Review*, IV (1956), 92-101.

Tanner, D. "Television and Education: A Critical Analysis." *Teacher's College Record*, LIX (March, 1958), 344-49.

Tanner, S. C. "Experiments in Teaching by Closed-Circuit Television." *School and Society*, LXXXV (1957), 229-230.

Tyler, I. Keith. "Research in Educational Broadcasting." *Audio-Visual Communication Review*, VII, No. 1 (Winter, 1959), 47.

Wermuth, P. C. "Some Weak Spots in Teaching by Television." *School and Society*, LXXXVI (1958), 127-129.

Westley, Bruce H. and MacLean, Malcolm S., Jr. "A Conceptual Model for Communications Research." *Audio-Visual Communication Review*, III (Winter, 1955), 3-12.

Williams, D. C., Paul, J., and Ogilvie, J. C. "Mass Media, Learning, and Retention." *Canadian Journal of Psychology*, XI (1957), 157-163.

Government, Educational Institutions, and Other Organizations

Allen, M. Robert. *Television, Education, and the Armed Forces.* The Quartermaster Training Command, Fort Lee, Va., 1 December, 1958.

Barrow, Lionel C, Jr., and Westley, Bruce H. *Television Effects: A Summary of the Literature and Proposed General Theory.* Research Bulletin No. 9. Madison, Wisconsin: University of Wisconsin Television Laboratory. May 26, 1958.

Broderick, Gertrude G. *Radio and Television Bibliography.* Bulletin 1956, No. 2. Washington, D. C.: Office of Education, U. S. Department of Health, Education, and Welfare. Government Printing Office, 1956.

Carter, Richard F. *The Perceived Appeals of Television Program Content.* Research Bulletin No. 8. Madison, Wisconsin: University of Wisconsin Television Laboratory. September 1, 1957.

Clemens, T. O. *A Comparison of the Relative Effectiveness of Direct Observation and Closed-Circuit Television Observation in Teacher Education.* San Jose, California: San Jose State College. September 30, 1956.

Cline, J. B., Beals, A., and Seidman, D. *Evaluation of Four-Week and Eight-Week Basic Training for Men of Various Intelligence Levels.* Technical Report 32. Washington, D. C.: Human Resources Research Office, George Washington University. 1956.

Closed Circuit Television Installations in Educational Institutions. Washington, D. C.: Joint Council on Educational Television and the Committee on Television of The American Council on Education, July, 1958.

Dumazedier, Joffre, and Sylwan, Barbro. *The Kinescope and Adult Education.* New York: UNESCO Publications Center. 1958. ✓

Dunham, Franklin and Lowdermilk, Ronald. Television in Our Schools Washington, D. C.: Department of Health, Education, and Welfare, Office of Education. 1953.

Dunham, Franklin, Lowdermilk, Ronald, and Broderick, Gertrude G. Television in Education. Bulletin 1957, No. 21. Washington, D. C.: Department of Health, Education, and Welfare. 1957.

Educational Television Report Number Two. Pocatello, Idaho: Idaho State College. March 15, 1957.

Educational Television Today A Status Report. Washington, D. C.: Joint Council on Educational Television. January, 1959.

Emphasizing Educational Television. Ann Arbor, Michigan: Educational Television and Radio Center. 1956.

Glendinning, K. and Casey, V. "Report on Some Uses of ETV in Fifteen School Systems of the United States. Denver Public Schools. June-July, 1958. (Mimeographed.)

Golter, Bob J. Bibliography of Theses and Dissertations Relating to Audio-Visuals and Broadcasting. Nashville, Tennessee: The Methodist Publishing House. June, 1958.

Greenhill, L. P. Final Report Instructional Film Research Program. The Instructional Film Research Program. The Pennsylvania State University. March, 1956. (Mimeographed.)

Hayakawa, S. I. Encyclopedia Brittanica. Chicago, 1956.

Hoban, Charles F. Critique on the Methodology of Research. Paper presented at the U. S. Office of Education Conference on Research in New Media. Washington, D. C. October, 1958. (Dittoed.)

Hoban, Charles F. and Van Ormer, E. B. Instructional Film Research, 1918-1950. SDC Human Engineering Project 20E-4. Port Washington, Long Island, New York: Special Devices Center. 1951.

How Instructional Television Works in New York State. Albany: The University of the State of New York, The State Education Department 1958.

Instructional Television Research Reports. Port Washington, Long Island, New York: U. S. Naval Training Device Center, Office of Naval Research. June 1, 1956.

Jackson, R. Visual Principles for Training by Television. Port Washington, Long Island, New York: Special Devices Center, Human Engineering Report SOC 20-TV-2. 1952.

Kanner, Joseph H., Katz, Sanford and Goldsmith, Peter B. Television in Army Training, Evaluation of "Intensive" Television for Teaching Basic Electricity. New York: Army Pictorial Center, January, 1958.

Keller, Robert J. and Gould, Crrin E. Closed Circuit Television in Teacher Education. Second Report. Minneapolis, Minnesota: University of Minnesota, June 15, 1957.

Kelly, G. A. and Conrad, L. H. Report on Classroom Television 1954. Montclair, New Jersey: New Jersey State Teachers College, 1954. (Duplicated.)

Kumata, Hideya. An Inventory of Instructional Television Research. Ann Arbor, Michigan: Educational Television and Radio Center, December 1, 1956.

Lofthouse, Yvonne M. An Experiment with Closed-Circuit Televised Instruction in Teacher Education. Detroit, Michigan: Wayne State University, 1957. (Unpublished Ed.D. dissertation.)

Martin, Gaither L. Television Project Report, Pictorial Report Number 1. San Jose, California: San Jose State College, September, 1958.

Martin, John R. Two-Way Educational Closed-Circuit Television. Research Report 948-1, Case Institute of Technology, January 15, 1957.

Mass Communication and Education. Washington, D. C.: Educational Policies Commission, National Education Association, 1958.

Meierhenry, W. C. A Study of Teaching by Television Under Two Conditions. University of Nebraska. (Mimeographed.)

Morsh, Joseph E. and Wilder, Eleanor W. Identifying the Effective Instructor: A Review of the Quantitative Studies, 1900-1952. Research Bulletin. Illinois: Training Aids Research Laboratory, October, 1954. Chanute AFB.

Niven, Harold F., Jr. Instructional Television as a Medium of Teaching in Higher Education. Ohio State University, 1958. (Unpublished Ph.D. Dissertation.)

Paulu, Burton (ed.). Lincoln Lodge Seminar on Educational Television. Urbana, Illinois: National Association of Educational Broadcasters, 1953.

Seibert, Warren F. An Examination of Instructional Methods in the Introductory College German Course. TVPR Report No. 1. Audio-Visual Center, Purdue University, January, 1958.

Smith, J. Asbury. *Implications of Television for Industrial Arts.* Detroit, Michigan: Wayne State University, 1957. (Unpublished Ph.D. Dissertation.)

Stanley, Raymond J., Carter, Richard F., and Dittberner, V. F. *Content Preferences in Television.* Research Bulletin No. 4. Madison, Wisconsin: U. W. Television Laboratory, University of Wisconsin, September 1, 1955.

Stoddard, Alexander J. *Schools for Tomorrow: An Educator's Blueprint.* New York: The Fund for the Advancement of Education, January, 1957.

Stover, Robert E, and Tear, Daniel G. *Evaluation of Two Kinescopes.* Port Washington, Long Island: The Instructional Film Research Program Special Devices Center, October 12, 1953.

Stuit, Dewey B. and Becker, Samuel L. *Some Faculty Reaction to Teaching on Closed-Circuit Television.* Iowa City: State University of Iowa, November 5, 1956. (Dittoed)

Telecourses at Western Reserve University, A Summary of the First Three Years--1951-54. Cleveland: Western Reserve University. (Duplicated.)

Television in Education. Bulletin 1957, No. 21. Washington, D. C.: U. S. Department of Health, Education, and Welfare, Office of Education, 1957.

Television in Instruction: An Appraisal. Washington, D. C.: Department of Audio-Visual Instruction, National Education Association, 1958.

Television Project Report, Instructional Closed Circuit Television, Installation, Operation, Potential. Study Report Number 1. San Jose, California: San Jose State College, 1958. (Mimeographed)

Television Research and the Study of Man. Port Washington, Long Island: U. S. Naval Training Device Center, October, 1956.

Television Teaching Project. Report for the Year, 1957-58. Detroit Public Schools. (Mimeographed.)

Twyford, Loran C. *Research in Mass Communications: A Decade of Basic and Applied Science in the Navy.* Washington, D. C.: Office of Naval Research, Department of the Navy, 1957.

Tyler, I. Keith (ed.). *NAEB Research Seminar.* Urbana, Illinois: National Association of Educational Broadcasters, 1958.

VanderMeer, A. W. Effect of Film-Viewing Practice on Learning from Instructional Films. Port Washington, Long Island: Special Devices Center, Office of Naval Research, Department of the Navy, November, 1951.

Williams, R. H. An Analysis of the Importance of Format to Educational Programs. University of Wisconsin, 1956. (Unpublished Ph.D.)

Withey, Stephen B (ed.). A Report of the Proceedings of the National Educational Television Research Conference. Ann Arbor, Michigan: Educational Television and Radio Center, December 4 and 5, 1958. (Duplicated.)